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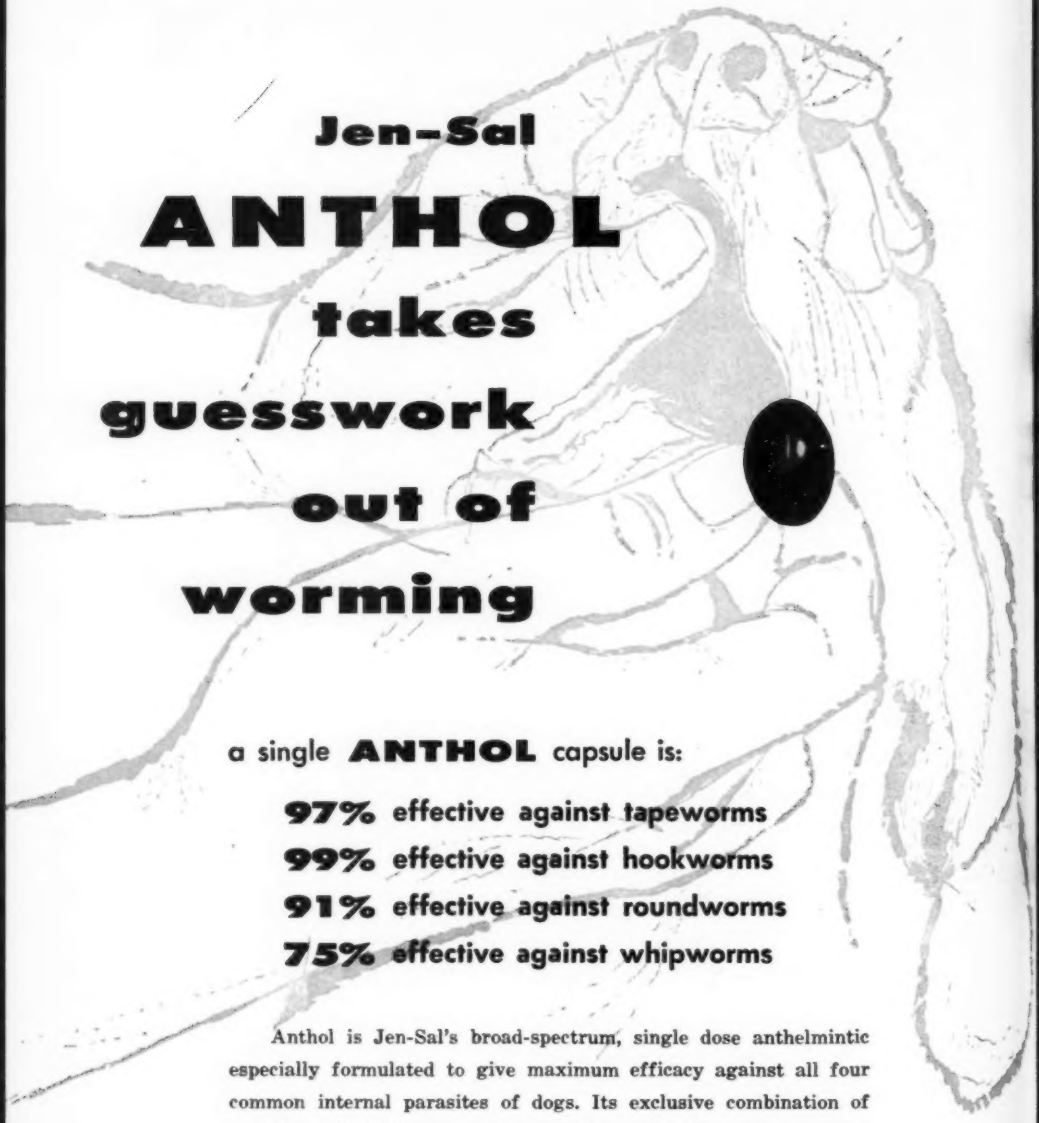

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STRESS AND THE HOST PARASITE RELATIONSHIP
S. K. Sinha, D.V.M., Ph.D.
Theory of stress as related to balance of the host with unfavorable influences is developed in this discussion based on research work conducted by the author.

AGRICULTURAL ECONOMICS AND THE VETERINARY PRACTITIONER
Earl Crouse
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A THOUSAND BLOOD SAMPLES FROM NORMAL BEAGLES
A. C. Anderson, V.M.D., Ph.D.
The author is the principal investigator of Canine Longevity Research, School of Veterinary Medicine, University of California, Davis. His study concentrates on the normal and healthy animal. Progress in all pathological problems is dependent on a thorough understanding of the normal.

PRACTICAL ENDOCRINOLOGY IN LARGE ANIMALS
H. J. Hill, D.V.M.
Basic considerations and methods of approach to the endocrine therapy problem in large animals is outlined by an experienced practitioner.

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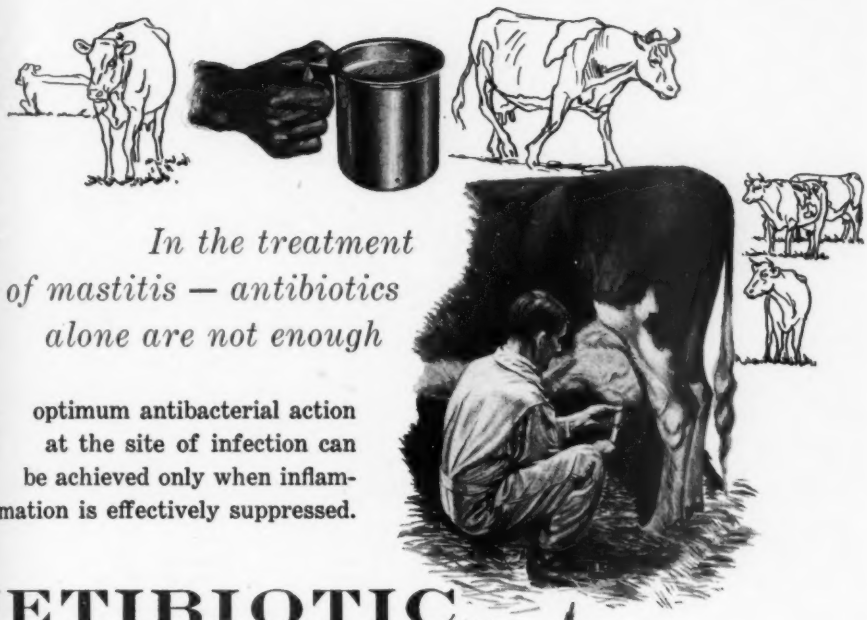

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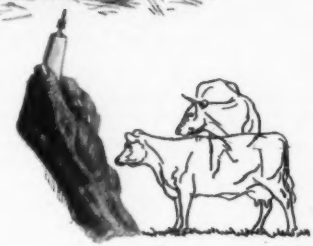

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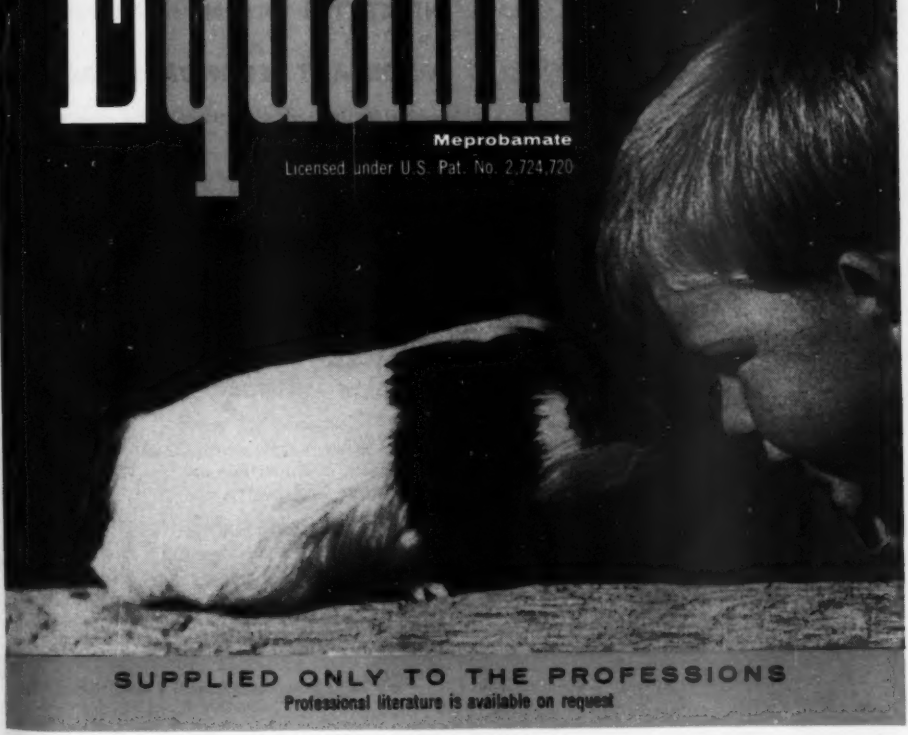

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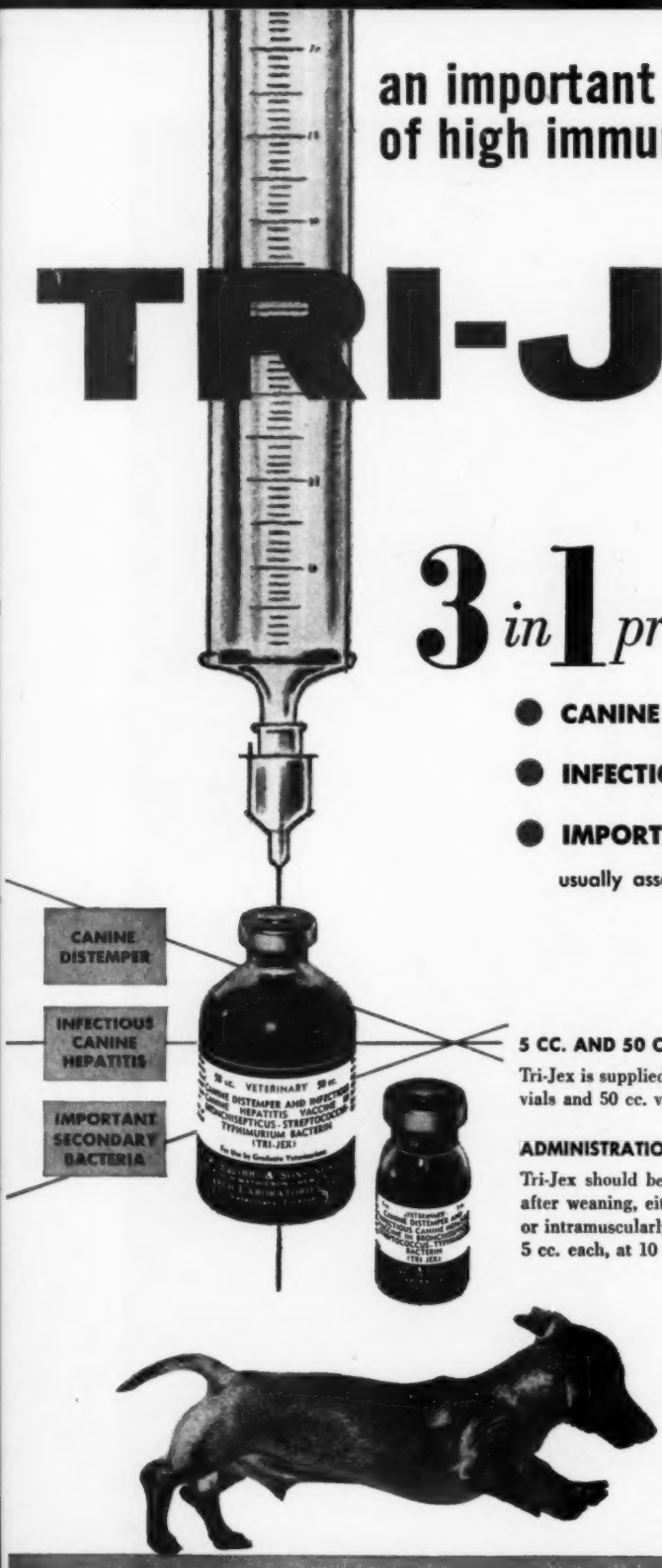

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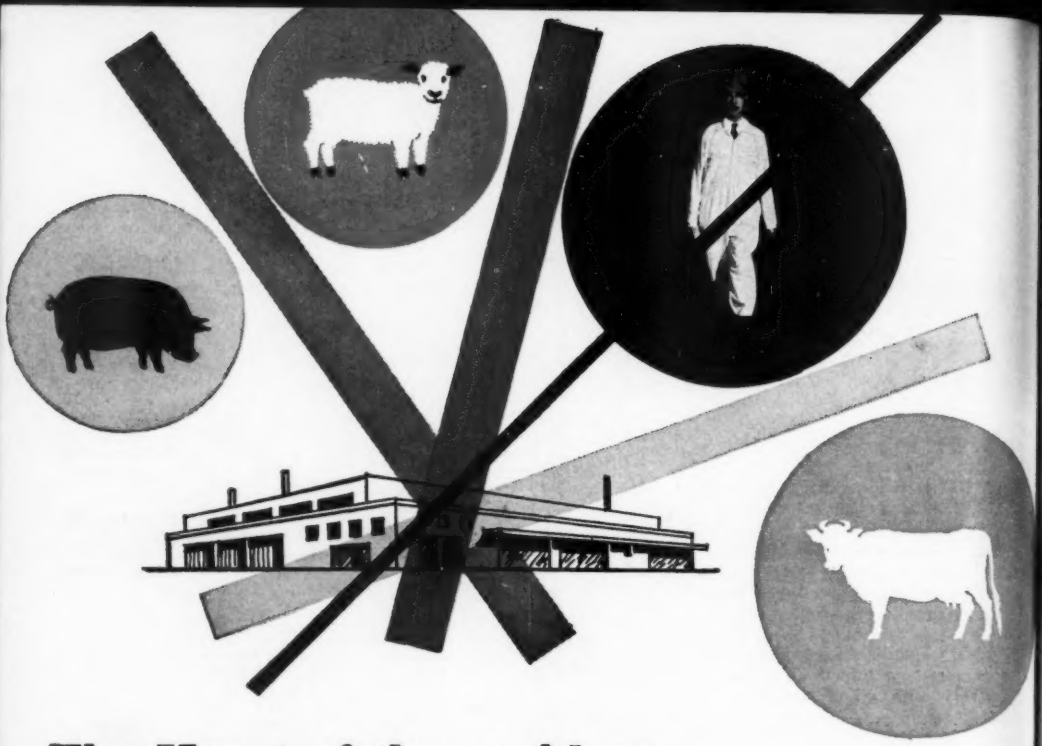

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News Comment

Mold Intoxication

Acute and chronic illness caused by eating moldy grain have been reported by Sippel (Iowa Vet., 28:15, 1957). Many outbreaks are associated with "bogged down" damaged cornfields. The toxicosis is characterized in swine by sudden death, extensive hemorrhage and free blood on the lumen of the gut. Cattle are susceptible.

Drugs in Market Milk

Sixty percent or 801 market milk samples collected nation-wide contained chlorinated organic insecticide residues, such at DDT, according to F.D.A.

Rift Valley Fever

Vector-borne Rife Valley fever, indigenous to Africa, may be a potential menace to both American live stock and the human population. The causative virus is notable because of its wide host range. It causes high mortality rates among young calves and lambs, and abortion in adults.

Fried Chicken

The nation consumes more than 1,000,000,000 broilers annually or approximately 2,000,000,000 lb. of chicken. Over 200,000,000 lb. feathers and 600,000,000 lb. offal are either by-products or waste.

How well the industry has solved the problem of economical utilization of waste products is refinement of feather meal now a by-product found useful as a supplement to poultry rations.

Vertical Integration

Vertical integration has commanded a good deal of attention in the farm press recently. This term denotes a linking of successful business functions or operations through

ownership of contracts. Complete integration ties all units of production, processing, and distribution together under one management. In this sense the idea is an ancient one. Private business in some broiler operations is a classic example of vertical integration.

The farm family of a century ago was completely integrated. It used crops and products produced by the family, and sold supplies. One by one certain operations left the farm so that today farms are essentially specialized operations. The trend toward integration is in a sense a trend toward operational concepts of a century ago on a massive scale.

Cattle Fever Ticks

Barring complications, the schedule for dipping of cattle for the coming 12-months period should rid infested premises in Florida of this costly pest. Prompt action by Florida disease control officials in setting up a system of inspection, quarantines, and systematic dipping procedures since the recent outbreak is producing desired results.

Anticancer Vaccine

Studies designed to measure the ability of antibodies to destroy test cells, both cancerous and normal, have led Dr. Jonas Salk, of poliomyelitis fame, to discovery of what might prove to be a major step forward in the development of an anticancer vaccine.

Cattle Feeding Operations

Abundant feed stimulated cattle feeding operations this past fall which pushed upward prices of feeder calves. Unusually large supplies of butcher stock are expected during the early spring. Depressed prices for finished cattle may result.

Rats and Disease

Rats have a long history as reservoirs and carriers of disease. That they continue to do so is reported by Beltsville scientists who suggest that these rodents may be carriers of atrophic rhinitis of swine.

Magnets

Dr. Robert Pierson, veterinarian in charge, ambulatory clinic, Colorado State University, reports in Hoard's Dairyman that over 400 Colorado cows are carrying small magnets. Their use is proving of real service in reducing incidence of "hardware disease."

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*Jones, S. V.; Belloff, G. B., and Roberts, H. D. B.: Vet. Med. 51:413 (Sept.) 1956.

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REFERENCES: 1. Bull, W. S.: N. Amer. Vet., In press. 2. Henry, R. T., and Blackburn, E. G.: Vet. Med., In press.

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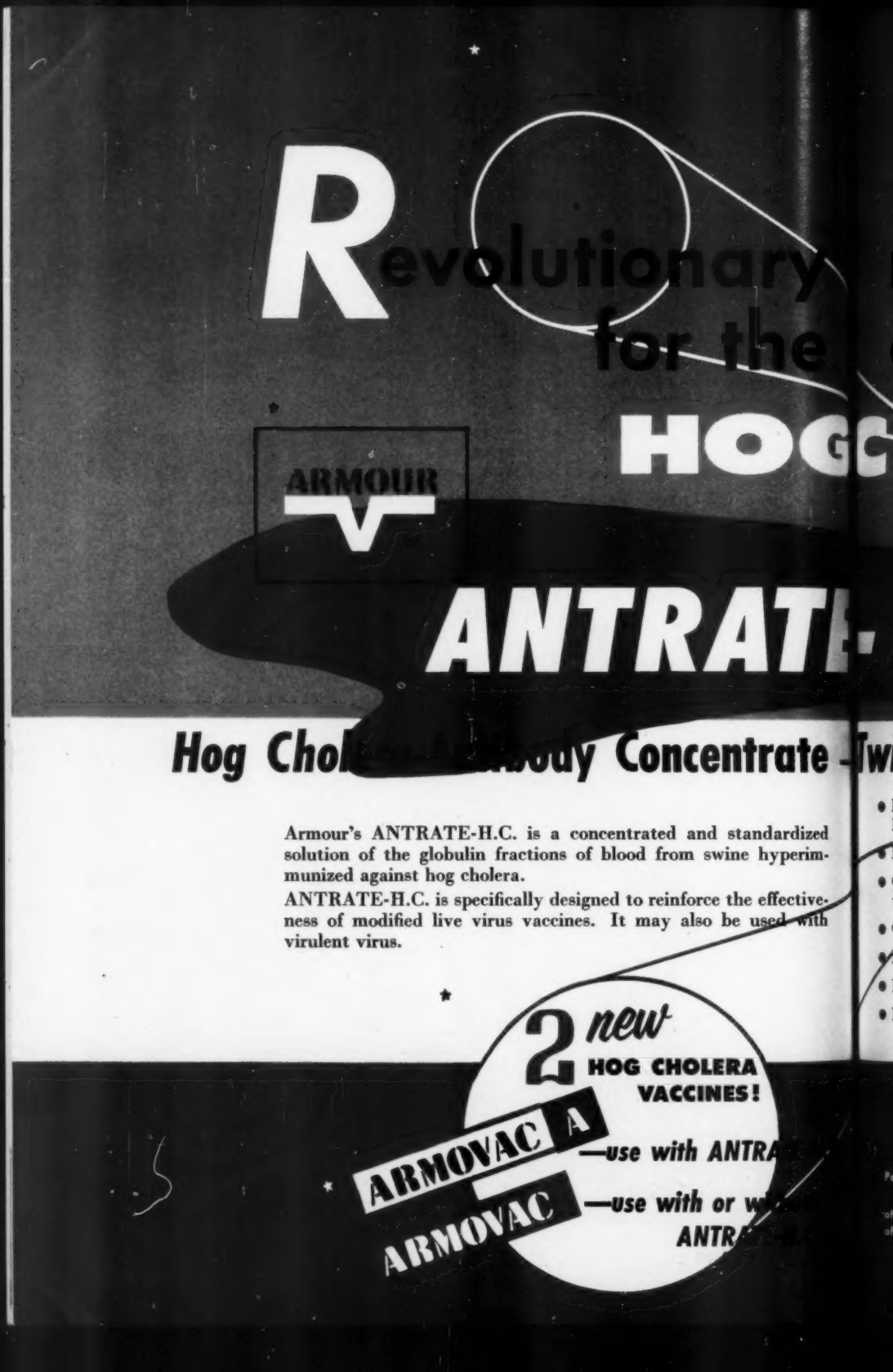
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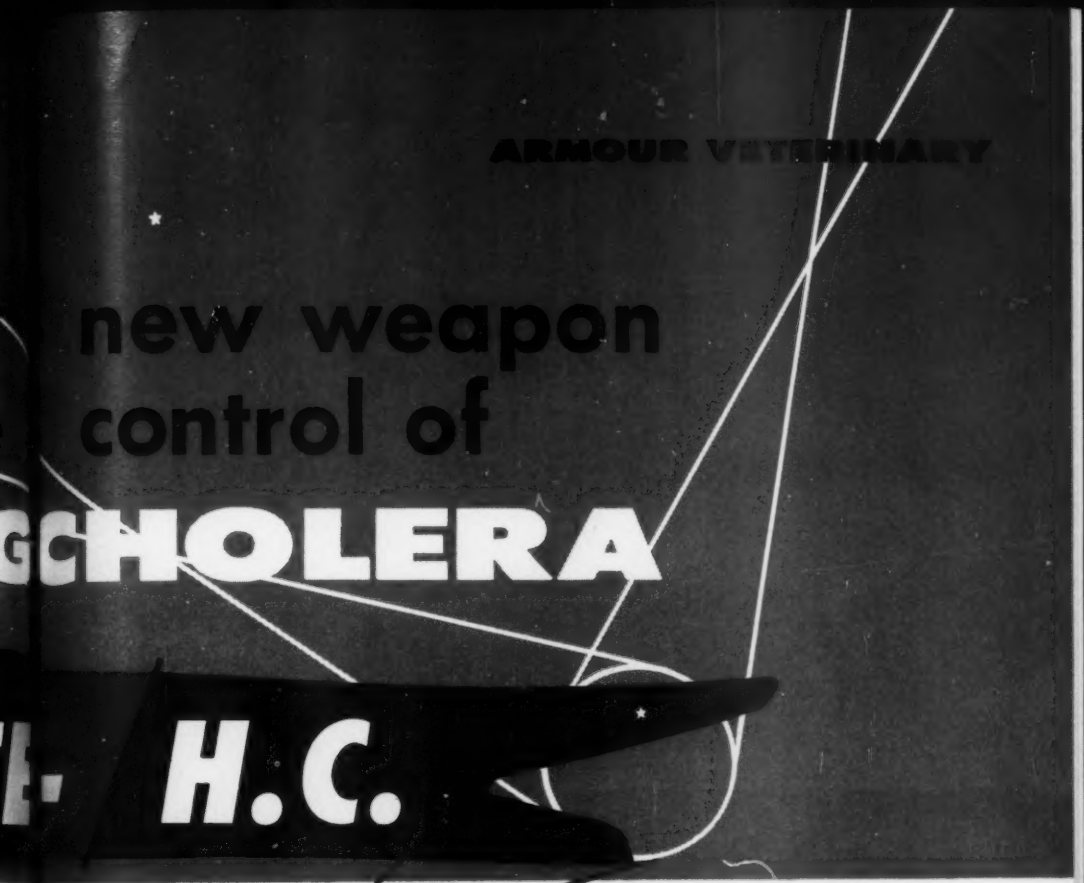

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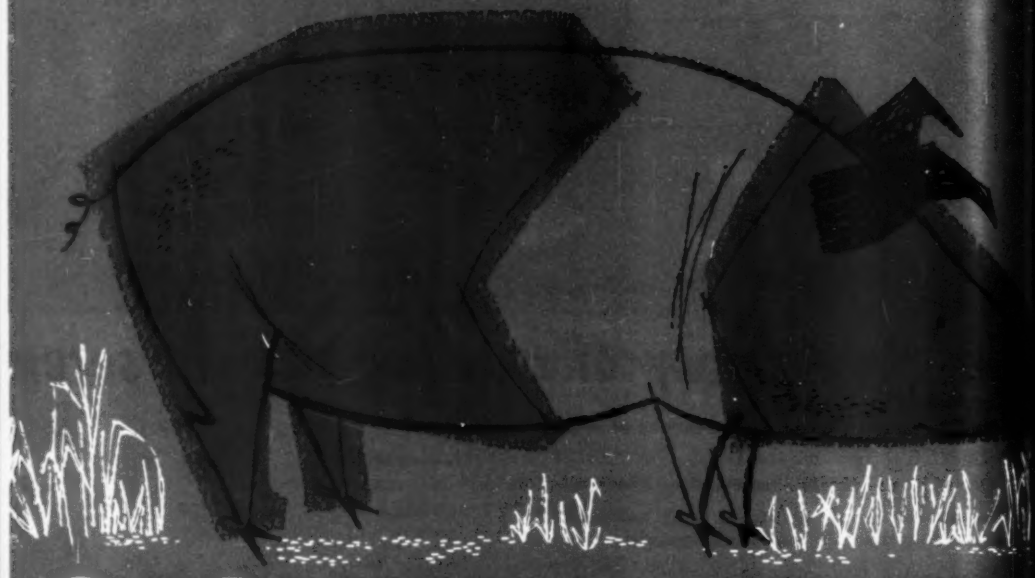

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Potential stress factors and their relation to the incidence of the shipping fever complex in cattle are pointed out in this discussion. Research report here by Dr. Nelson B. King was presented at the Stress on Livestock Conference which convened in Kansas City, Missouri on December 10, 1957 under the sponsorship of Jensen-Salsbery Laboratories.

Stress Factors in Shipping Fever

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SHIPPING fever is an acute respiratory disease which occurs commonly following movement of cattle. It is observed frequently by practitioners in lots of beef cattle following shipping from range areas to midwestern feedlots. Losses suffered are equally serious when dairy cattle are moved.

Loss Statistics

The disease causes loss in weight and condition, lengthening of the feeding period, and deaths. The national loss in production is estimated by the Agricultural Research Service, to be $25,000,000. each year.[1] To this must be added the cost of attempted prevention and treatment of sick animals.

Although accurate figures on incidence of shipping fever are not available, the following information gives some indication of the serious nature of the disease. While not prominent for cattle feeding, reports from 40% of Wisconsin's veterinarians indicate that 7,000 animals on 800 farms suffered shipping fever during the year 1955-1956. They have estimated cost of treating a single case at $10. to $20. This would make up a yearly loss in excess of $100,000. for treatment alone. It has been estimated that approximately 10% of the 750,000 to 800,000 beef cattle fed in Illinois develop shipping fever. Kansas reported 4,343 cases during the year 1955-1956. This was based on reports of approximately 20% of the practicing veterinarians. In Ohio, less than 50% of the state's practitioners reported over 12,000 cases each year in over 2,000 herds. During the year ending October 30, 1956, 16% of Minnesota veterinarians reported 2,765 herds affected. It is reasonable to assume that other states in the Corn Belt experience similar losses.

Symptoms of Disease

The first and probably most important signs of shipping fever are a tired appearance, a reduced appetite, chilling, and a light cough. These symptoms, and others, usually appear two to 14 days after cattle arrive at the feedlot or following the addition of exposed or carrier animals to sus-

ceptible herds. Close observation of affected animals may reveal body temperature as high as 107 F., accelerated pulse, discharge from the eyes and nose, and diarrhea. Rapid breathing and marked depression may also be noted. Deaths are usually due to an extensive bronchopneumonia.

Etiological Stress Factors

Probably the most striking feature of the description of shipping fever is the severe stress to which cattle are subjected, after leaving the range. Some of the so-called stress factors are weaning, irregular feeding and watering, exposure to unusual weather conditions, overcrowding, exposure to pathogens, and contaminated quarters during transit, et cetera. Carter[2] reported that shipping fever in the Toronto stockyards is almost non-existent when there are no western cattle passing through the yards. Signs of the disease are noticed when normal vigor is decreased due to undue stress or strain. Usually harmless microorganisms which are ever present in normal animals may begin to multiply and eventually produce signs of disease when resistance is lowered by these various factors. Although it is thought to be primarily a stress disease, shipping fever once started in a herd, increases in virulence and may affect animals that have not been subjected to these debilitating factors.

The lack of knowledge concerning the true cause of this disease syndrome indicates that the problem is complex. This, together with the high cost of cattle disease investigation, explains in part lack of research on incidence, cause, treatment, and control.

Prophylactic Agents

Early studies in cattle revealed the presence of Pasteurella spp. in many affected animals, and this was considered as evidence that this microorganism was the cause. However, Pasteurella has been recovered at times from apparently normal animals and failure of isolated species to reproduce disease experimentally leaves some doubt as to it being the sole cause of naturally occurring disease. Various biological products; such as shipping fever bacterins, hemorrhagic septicemia antiserum directed against Pasteurella have been available to the profession for many years. The results of their use have been variable and generally not entirely satisfactory. In 1932, Scott and Farley[3] worked on thousands of cattle shipped to Kansas City stockyards. These men found that bacterins and agressins failed to provide protection against shipping fever, in fact, losses were higher in the vaccinated than in unvaccinated animals. There are some who argue that these results would have been different had the cattle received the inoculation seven to ten days prior to leaving the range. But failure of this method of vaccination has often been observed. Carter[4] reported that the hemorrhagic septicemia bacterins do not contain some of the types of bacteria he has found

Fig. 1. Fence walking and bawling following weaning.

in severely infected animals. In spite of the debatable value of the hemorrhagic septicemia bacterins, they still enjoy great popularity with nearly 14,000,000 doses produced in this country each year.

Antiserum for Treatment

The value of hemorrhagic septicemia antiserum used as preventive is seriously questioned by several investigators. We[5,7] at the Ohio Agricultural Experiment Station found that hemorrhagic septicemia antiserum used on cattle following shipment to prevent shipping fever had little or no value. Palotay[6] working under practical feedlot conditions in Colorado, tested the efficiency of serum inoculations in 1,327 calves. He reported that more of the animals inoculated with serum required medical attention than the group which did not receive antiserum. In 1955, the Health of Animals Division of the Canadian Department of Agriculture announced that the distribution of antiserum for use at public stockyards where cattle are assembled would be discontinued.[8] They based their decision on an extensive survey which revealed that antiserum gave little protection against shipping fever. Of 4,000 cattle inoculated, 6.5% were sick on arrival and 35 died. Of 3,200 animals untreated 5.4% were sick on arrival and 30 died.

While the theories as to the cause of the disease, and whether or not antiserum and bacterins should be used are still debated, there is almost universal agreement on one important fact. Shipping fever can be effectively treated. This favorable response to treatment may be another reason why more research has not been attempted.

Today, most veterinarians rely on various antibiotics and sulfonamides for the prevention and treatment of the disease, rather than antiserum and bacterins.

Research in Progress

Work started at the Ohio Station in the fall of 1952, when we began to investigate some preventive and treatment measures for controlling shipping fever. At that time two separate lots of feeder cattle were obtained for use in breeding and feeding experiments for our Animal Science Department. This is one example of how it has been possible to extend research dollars.

One shipment of 134 calves averaging 452 lb. were purchased at the Kansas City yards. Approximately one-half of the calves were given 40 cc. hemorrhagic septicemia antiserum at the time of unloading at our station. The remaining one-half were left untreated.

All of the 134 calves appeared tired on arrival. There was some coughing and a few calves did not eat. Symptoms of shipping fever — labored breathing, diarrhea, depression, loss of appetite, and elevated temperatures, which frequently reached 107 F., were observed to develop between the second and seventh day after arrival. Approximately 14% required treatment. Shipping fever occurred in both groups irrespective of preventive treatment received. Thus it appeared that the serum administered on arrival was of little or no value in preventing the disease.

In addition to the group of 134 calves another shipment of 50 bull calves weighing 400 lb. was received and placed in a different barn. This group was shipped directly from a ranch in northern Texas. A small number in this group required treatment. These calves responded rapidly to sulfonamide medication. It appeared that a less virulent strain of the agent, or less severe conditions of transportation and exposure, or both, may have accounted for moderate severity observed in this instance.

This conclusion was partly responsible for the decision to buy cattle direct for breeding and feeding investigations for the following year. Also Dr. Earle Klosterman of our Animal Science Department was interested in obtaining animals of uniform size and similar breeding background for his nutritional work.

In the fall of 1953, 248 Hereford calves weighing 450 to 550 lb. were purchased and shipped directly from two ranches in northern Texas to the Ohio Station. These calves, as well as their dams, were in excellent condition at the time of shipment. Handling of calves at the time of segregation, treatment, and loading for shipment

was done with utmost care. Railroad cars used in shipping were clean and bedded with fresh sand.

Following weighing, all animals were treated for ear ticks and given preventive treatment for shipping fever and then the calves were turned back with the cows before loading the following day.

Of the 248 head shipped, 73 (30%) picked at random, received 1,500,000 units of the long-action type of penicillin intramuscularly. Another 73, also picked at random, received 50 cc. of antiserum subcutaneously, and 31 purebred heifers and two purebred bulls were treated with both penicillin and serum. To serve as controls, another 68 (30%) animals, also picked at random, were left untreated. All treated groups, with the exception of the purebred animals, were divided equally in five standard cattle cars.

Shipping Point to Destination

I was fortunate enough to draw the assignment to accompany this shipment in order to make observations on the feeding, watering, exposure, and general management of the cattle from the shipping point in Texas to the final destination in Ohio.

As a rule, the carloads of cattle were positioned near the engine in the train to make them more comfortable by reducing the slack-action. Usually, trains were made up to contain about 80 to 100 cars. Other cars of cattle were also included on this train. The only regular stops made were at division points, approximately every 110 miles. At these points, there was usually a delay of 45 minutes to as long as six hours. Usually this delay was due to changing train crews, servicing equipment, and switching. It was these long, seemingly avoidable delays which accounted for approximately one-half or more of the total time necessary to complete the trip.

Approximately 33½ hours were required to reach the sixth division point and rest station at Fort Madison, Ia., which was approximately 650 miles from the shipping point where the cattle were unloaded for feeding and resting. Each car load was placed in separate pens. Water and 200 lb. of prairie hay were given to each pen of cattle. The cattle drank less than the normal amount of water and each carload ate approximately 100 lb. of the hay. Watering and feeding facilities were inadequate due to leaky troughs and lack of feeder space. A constant supply of water was not maintained in spite of the high temperatures. The yards were partly covered, but were dusty and there was little bedding. Cattle were uneasy, milling around the pens most of the time.

Disease exposure was probable because disinfection and cleaning between handling of different groups was inadequate. Also, there was opportunity for contact with ani-

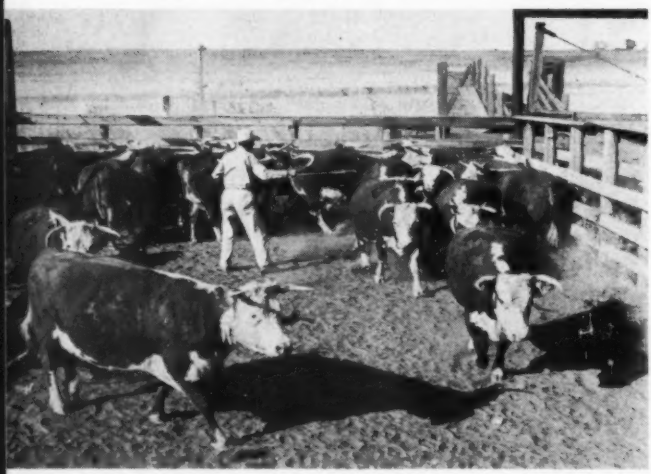

Fig. 2. Separating calves from their dams in the corral.

mals in adjacent pens. It appeared that much could be done to improve not only facilities for handling cattle but also measures to reduce unnecessary delays all along the road.

During the six weeks, following their arrival in Ohio approximately three fourths of the 248 cattle exhibited one or more of the following clinical signs: Elevated temperature (104 to 108 F.), chills, loss of appetite, difficult breathing marked by extended head, open mouth and protruded tongue, "pumping" type of respiration, coughing, diarrhea, discharge from eyes and nose.

Of the 248 cattle, 71 (29%) required treatment. Usually sulfonamides and antibiotics were used.

Under the conditions of these experiments hemorrhagic septicemia antiserum apparently had little or no value in controlling shipping fever. While there was a decided difference between the animals which received penicillin and the non-treated controls, nevertheless, we did not feel the protection offered by penicillin was as good as desired.

During 1954 and 1955 this experiment was repeated. In addition, some of the calves were creep-fed for 30 days prior to shipment. The same calves were fed grain in the rest yards on their way to Ohio. The idea was to try to keep resistance high in an attempt to prevent disease. Some were shipped by truck to see whether or not exposure in the yards was a factor in infection. When the calves reached Ohio some were placed in a closed barn, some were put in open lots in an effort to determine whether environment had any effect on the development of the disease. Results of all this work during a two-year period were quite disappointing. We had no shipping fever. Of course those who purchased these cattle for feeding trial work were quite happy.

One of the big problems with this work is that dependence must be placed on spontaneous development of the disease. It can not be reproduced at will.

Another phase of this work has been attempt to transfer infection from sick

Fig. 3. Identification of range animals by branding.

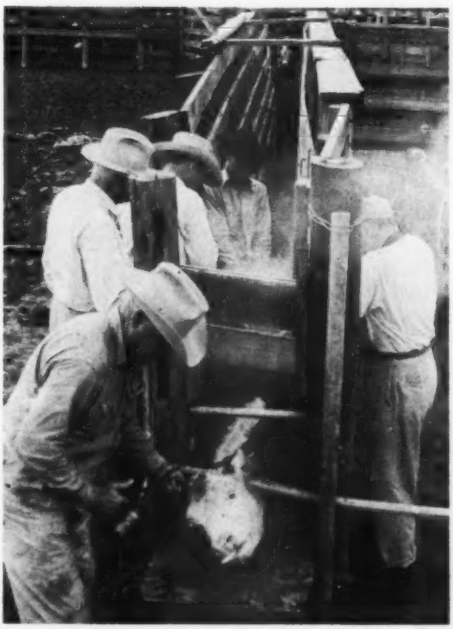

Fig. 4. Animal being prepared for shipment by branding and injection of antibiotics.

calves to native calves. Blood, washings from the noses, and ground up lung tissues from the sick calves have been injected into our native calves with some success. We feel that this phase of our work needs much attention because if the disease could be produced experimentally then we would be well on the road to solving it.

Last year with the hope that the condition might develop again we repeated work similar to what had been done before. In addition about 50 head of calves were weaned about three weeks prior to shipment. The remaining 350 were weaned at the time of shipment. Again the animals were divided in groups depending on the type of treatment. This time we were more fortunate. Approximately 25% exhibited some signs of the disease and 10% were sick enough to require additional treatment.

Approximately 13.5% of the control animals required therapeutic treatment. Nine percent of the prophylactically treated group required therapeutic treatment. Approximately 3.5% of the group treated prior to shipment and retreated following shipment, required therapeutic treatment. The severity of clinical signs of disease appeared to be greater in the control group than in the prophylactically treated group. There was little or no difference in incidence between weaned and unweaned groups. Similar work carried out again this year gave almost identical results.

Summary

Under the conditions of these experiments hemorrhagic septicemia antiserum used as a preventive had little or no value in controlling shipping fever. Various antibiotics such as penicillin and a combination of penicillin and streptomycin appear to be of some benefit especially when given prior to shipment and again when cattle arrive at the feedlot.

There is a real need for livestock disease control officials to study measures for improving sanitation and facilities for caring for cattle in transit. Also study should be given to measures for reducing shipping fatigue by eliminating, as much as possible, the time required for shipping cattle from the range to feedlot areas.

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Ornithosis in Turkeys

In a random sampling of Minnesota turkey breeding flocks, approximately 15% gave positive serological evidence of prior exposure.

Ornithosis is definitely present in turkeys in Minnesota and Wisconsin and undoubtedly in all major turkey rearing areas in the country.

Clinical diagnosis is difficult. According to progress report from the Minnesota Experiment Station, warning signs of infection include (1) apparent respiratory distress, droopiness, drop in feed consumption, and loss of weight, (2) sulfur dropping, and (3) lower egg production. In uncomplicated cases no sinusitis is present but many outbreaks in breeders flock are mixed with sinusitis, aspergillosis, and cholera. Cloudy air sacs with accumulated pus and exuded matter on heart sac or other internal organs are common findings at autopsy.

Full cooperation of growers is called for to assist in adequate control. Turkeymen are urged to get an early and accurate diagnosis, quarantine sick and exposed birds, employ high level antibiotic feeding, keep consumers correctly informed and cooperate with state livestock disease control officials.

Prior to development of ataraxics, the only agents available for management of all species in hyperexcitable states were bromides, barbiturates, and chloral hydrate. Both the patient and clinician have benefited by the advent of psychic drugs for chemical restraint. With proper administration, anxiety and apprehension of the patient are relieved and the work of the veterinarian thus facilitated.

Tranquilizers in Large Animal Medicine

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THIS paper is presented with the intention of creating a possible interest in a product of recent development which should prove of particular interest and assistance to the general practitioner.

For the past year, members of the clinical staff of A. & M. College of Texas have been doing considerable work with chemical restraint drugs in large animals.

Experience has been limited to the use of three of these: Promazine hydrochloride, chlorpromazine and succostrin hydrochloride. The first two are included with those of the phenothiazine series and are generally known as tranquilizers. Whereas older hypnotics and sedatives stupefied patients by depression of the higher cortical centers, this group is believed to exert its action by altering certain metabolic functions of cells, particularly those of the nervous tissue. They are referred to as ataractics, which means "freedom from confusion." Their use has practically eliminated, or at least reduced to a minimum, need for physical or manual restraint in many animals, particularly those that are highstrung, vicious, or difficult to handle. Opinions concerning these agents are based on clinical observations and not on controlled experiments.

Clinical Experiment

Sparine (brand of promazine hydrochloride, Wyeth Laboratories, Philadelphia, Pa.) was the first of this group subjected to clinical trials. It is to this drug that comments will be limited.

A 1,000-lb. horse was injected intravenously with 1.25 gm. sparine (25 cc. dose — 50 mg. per cc.) daily for 15 days. This dosage was considered to be 2½ times normal. Blood samples were taken daily and the animal was observed for four hours each day. Although almost complete relaxation was observed, about five minutes after intravenous administration and lasting about four hours, there were no other results or unfavorable sequela. No blood

dyscrasis or any other systemic or local side effects occurred. The subject, although appearing to be asleep, could be aroused and moved about freely and with little or no ataxia or noticeable inconvenience. The horse was practically oblivious to any external stimuli, slapping, venipuncture, subcutaneous or intramuscular injections, or even minor surgery or suturing.

One of the outstanding effects immediately noticeable was complete relaxation of the retractor muscles of the penis with resultant dropping or protrusion of the organ. It was subsequently found that the same effect was evidenced in bulls which greatly facilitated and simplified many operative or therapeutic measures in these animals. Relaxation of the retractor penis muscle occurred regularly on intravenous administration of 500 mg. (10 cc.) promazine hydrochloride in bulls weighting from 1,000 to 2,000 lb. It was possible to withdraw the penis completely simply by grasping the glans and with little effort extending the organ.

Since first trials with this drug were made, some staff members have become enthusiastic users and now employ the new agent in a great variety of conditions in both horses and cattle.

One of the main advantages of promazine hydrochloride is the fact that under its influence animals are able to move about freely. Treated horses and cattle are apparently quite steady so that danger of injury by falling is minimized. Excitement, tension, viciousness, and other unruly tendencies are entirely controlled. There is a variation in response, and accordingly the dose can not be determined on the basis of size or weight alone. Noticeable effect will be noted from 10 cc. of the preparation (500 mg.) in a 1,500-lb. bull, but occasionally it will be necessary to use 15 cc. to produce the same effect in another 1,000 -lb. animal. Individual susceptibility is quite variable.

Observations suggest that the age of the subject probably has more effect on the action of the drug than does weight, since younger animals appear to require larger doses per unit weight. Controlled experiments based on this premise have not confirmed this observation, however.

Routine procedure is to give 10 cc. (500 mg.) to all cattle over 800 lb. and 10 cc. (500 mg.) to all horses over 1,000 lb., as an initial dose. The intravenous route is used exclusively. If the desired results have not been obtained after approximately ten minutes an additional 5 cc. dose is given by the same route.

In many instances, and in a variety of conditions, promazine hydrochloride has been used alone as an agent to facilitate handling of patients. In fact, usage has become nearly routine and the types of cases in which it is indicated are almost unlimited. They include removal of placental membranes, minor teat surgery, replacement of prolapsed uterus or vagina, rectal examinations in nervous or unruly patients, routine procedures such as examination of teeth or tongue, trimming hoofs and changing of bandages or wound treatment. It can be used with appropriate local anesthesia for rumenotomy, amputation of the digit, laporatomy or enucleation of the eye. Another advantage is that this drug is not incompatible so that it can be given without effect on the action of other indicated drugs.

Clinical Reports

The following are examples of the cases in which promazine hydrochloride has been found to be especially indicated.

Fig. 1. Removing adhesion from bull's penis after administering 10 cc. promazine hydrochloride.

A large hydraulic operating table is employed at the clinic in many surgical procedures in both horses and cattle. In practically each instance, promazine hydrochloride is administered to facilitate maneuvering patients on the table.

In circumcision of the bull it has been especially useful, since relaxation of the retractor penis muscle assists in simplifying surgery. Local infiltration anesthesia is all the supportive anesthesia required.

In many instances in which radiographic studies are being made on nervous subjects, it has been our experience that patients will remain quiet during procedures. Resultant loss of time and unsatisfactory *x*-ray plates are eliminated.

Injection of sparine quiets cows that are occasionally nervous at the time of delivery. Examination is thus facilitated and straining reduced. It apparently does not interfere or delay normal uterine contractions, although violent, nervous straining and fidgeting are eliminated.

In standing castration of horses, although this operation is not particularly recommended, use of this tranquilizer greatly facilitates demonstrations of this surgical technic, and although care must still be exercised, the speed of movement of the patient is retarded and the risk to the operator minimized.

Occasionally an animal is presented which is simply difficult to handle, and in all instances sparine has served usefully to minimize effort and time.

Frequently the actual cautery is used to remove excess tissue from a laceration or granulation tissue from a wound. In such cases, as well as in firing, tranquilization has made it possible to do a better job in less time, with a minimum of effort, or struggling.

In injuries to the penis, particularly in bulls, adhesions between that organ and the prepuce frequently result. Successful manipulation to break down these fibrous adhesions has been possible under the influence of promazine alone. This is far simpler than resorting to pudental nerve block or general anesthesia.

Similarly, following surgery on these

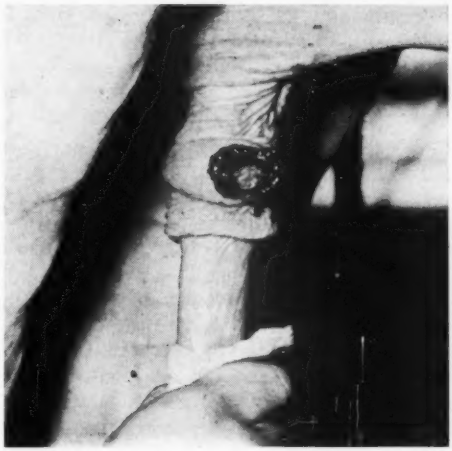

Fig. 2. Relaxation of retractor muscle of penis of horse exposing lesion for treatment was accomplished with 10 cc. promazine hydrochloride.

parts, lacerations, hematomas, et cetera, we employ promazine daily to facilitate withdrawal and treatment of the penis to prevent formation of adhesions. Wounds, abrasions, or screw worm infestations can be treated effectively and simply with a minimum of effort and danger to the operator.

Electro-ejaculation Under Tranquilization

Another observation, and one which may border on the unusual, is that this drug does not interfere with electro-ejaculation of the bull. At this clinic, quite a number of bulls are presented for examination to determine their reproducing capabilities concerning fertility and, since a cow in estrum is seldom available, we can not make use of the artificial vagina to obtain semen for examination. Many of these bulls are difficult to manage and have never been subjected to the electro-ejaculator. It has been found that 5 or 10 cc. (250-500 mg.) of promazine hydrochloride intravenously quiets the animal and still permits satisfactory electro-ejaculation.

Its use to relieve pain in cases of colic must not be overlooked. In a large number of instances in which animals have been suffering extreme pain with the usual actions of kicking, dropping, rolling, et cetera, promazine has proved effective in overcom-

ing pain and facilitating examination and treatment. Generally one injection will serve until medication has taken sufficient effect that pain is no longer evident. Certainly, it makes leaving the patient in the hands of the client much simpler.

In cases of abdominal or prolonged surgery in which a general anesthetic agent is deemed advisable, promazine (sparine) may be used advantageously as a preanesthetic agent. Its use in these instances indicates that the patient can be brought to a satisfactory stage of surgical anesthesia with 1/3 to 1/2 of the full dose. Satisfactory termination of these cases results from avoiding the possible dangerous side effects of a full dose of any general anesthetic. Time required for recovery from the anesthesia is lessened by approximately one-half.

Promazine hydrochloride alone for sedation and local infiltration anesthesia has been used routinely in several major surgical cases. Recovery of these patients was credited to a large extent to the use of the tranquilizer. These patients would not likely have survived had any other anesthetic agent available been employed.

To date, no deleterious side effects have been experienced or unfavorable sequela, or evidence of toxicity, directly resulting from the use of this drug. It may be used with safety, is dependable, and has a wide variety of indications.

Artificial Insemmation Facilitated by Frozen Boar Semen

Primary value of artificial insemination technics, regardless of species, is to extend the use of superior sires. Perfection of storage methods has been so advanced for bulls as to assure practical success and a sufficiently high conception on first service to be economical.

Boar semen is less resistant to cold shock than bull semen. Studies at the Ohio Experiment Station (*Ohio Farm and Home Research*, Nov.-Dec. 1957) include observations on treatment of various extenders, preservation, and freezing. It is fairly well established that boar spermatozoa does not possess cellular resistance to cold shock. Resistance must be developed for freshly collected semen or must be included in the semen nutrient extender to be added.

Studies on 25 gilts inseminated with semen stored for various periods from one to 19 days have given hope for prolonging viable boar semen by freezing. Of seven gilts inseminated on the second day of heat with 100 ml. of frozen semen, six conceived on first trial and the seventh on second insemination. An average of 9.4 pigs were determined by examination at slaughter 20 to 60 days postinsemination.

Methods of Collection and Handling Semen

Semen was collected by artificial vagina mounted in a dummy. Gel portion of ejacula was removed by filtering and filtrate immediately diluted with a mixture of egg yolk and glucose in water. Dilute semen was cooled slowly and glyerol added to minimize shock. Subsequently temperatures were reduced and final storage was at -75 C. Immediately prior to use a measured quantities was thawed in cold water and 100 ml. used for each insemination.

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Scrapings from shed walls, stalls, and posts where cattle with ringworm had been housed were found to be contaminated with the dermatophyte *Trichophyton verrucasum*.

The original report (*Brit. Med. Jour.*, 4953, 1955) states that spores in the scrapings remained viable in the laboratory at room temperature for 15 months. The probability exists that spores would have an equally long survival period in nature. This suggests that susceptible animals and man could become infected by contact with contaminated objects.

In this discussion Doctor Gregory adds evidence to that already published relating to the infectious nature of edema disease (see reference list). Complete paralysis of forelimbs in a naturally occurring case of E. coli toxemia is illustrated at left.

Edema Disease (E. coli Toxemia) of Swine

D. W. GREGORY, B.S., M.S., D.V.M.

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PUBLICATIONS by Schofield and Davis;[1] Gregory;[2,3] Timoney;[4] Sojka, Erskine, and Lloyd;[5,6] Lemke, Bellis, and Hirsch;[7,8] Gitter;[9] and Gitter and Lloyd[10] provide substantial evidence that the syndrome, commonly referred to as edema disease or gut edema, is in fact an infectious disease caused by certain hemolytic *Escherichia coli* serotypes. Since such organisms can be consistantly isolated from affected pigs in great numbers and since lesions and symptoms can be produced in susceptible animals with products of such organisms, the disease is referred to in this paper as *E. coli* toxemia.

For many years, *E. coli* has been regarded as being of etiological significance in white scours of calves and diarrhea of human infants. More recently it has been established that the pathogenicity of *E. coli* in diarrheal diseases is correlated with antigenic composition. Briggs and associates[11,12] have stressed the importance of the K antigens in the pathogenicity of strains and have shown that the presence of homologous K antibody in colostrum is essential for calf survival. Ingram *et al*[13] reported that colostrum fed calves die of diarrheal disease when colostrum does not contain K antibodies against type-specific infection.

Among the important questions bearing on *E. coli* toxemia that have remained unanswered are: (1) What organism types are involved and what is the relative importance of each? (2) What factors elaborated by certain strains are instrumental in producing the disease? (3) What mechanism is involved or how is the toxemia produced? (4) How can the disease be treated and controlled?

The data reported herein are designed to throw some light on the above questions and to stimulate further investigational work on the basic problems involved.

Organism Types in E. coli Toxemia

In the early part of 1956, five hemolytic *E. coli* cultures isolated from three different outbreaks were mailed to Dr. W. H. Ewing, Enteric Bacteriology Laboratory, U. S. Public Health Service, Chamblee, Ga. Doctor Ewing reported that the three cultures isolated from one outbreak were related to 0 group 102. The other cultures

Fig. 1. Edema of eyelids and snout in experimental *E. coli* toxemia.

were identified as being related to O groups 8 and 25, respectively. More recently, after further study and consultation with Dr. F. Kauffmann, International Salmonella and Escherichia Center, Copenhagen, Doctor Ewing has reported on the O and H antigen composition of the above cultures and on 20 additional cultures supplied by the writer. The final O antigen group designation for the strains related to O groups 25 and 102 are, respectively, 138 and 139. The data are assembled in table 1.

The writer has prepared OK antisera with specimens of O groups 5a, 5c, and 139, and has run agglutination tests with most of the cultures examined by Ewing. The K antigens of the organisms within O group 5a, 5c, and within O group 139, were found to be identical or similar, but there appears to be no K antigen relationship between strains of these two O groups. In addition, strains of the other O groups that have been examined apparently have K antigens which are unrelated to the organisms used in the preparation of the antisera. In a recent outbreak of *E. coli* toxemia, cultures were made from three pigs and positive isolations accomplished in each case. These organisms appear to belong to O group 139 and to possess the same K antigens as the other isolates of the same O group.

TABLE 1. Antigenic Analysis* of 25 Strains of Hemolytic E. coli
(Dr. W. H. Ewing, U. S. Public Health Service)

No. strains	Outbreaks	O groups	H antigens identified
11	9	139	1
6	5	138	14 (3 strains nonmotile)
3	3	5a, 5c	9 (2 strains nonmotile)
1	1	46	5
1	1	75a, 75c	2
1	1	8	16
1	1	OX11**	(nonmotile)
1	1	OX12**	(nonmotile)

*K antigen analysis not completed. **Temporary designation.

Study of Field Cases

A review of the data on the herds from which the above isolations were accomplished reveals some interesting features. Four of the identified isolations were accounted for on one farm in which three outbreaks occurred within a six-week period. Several isolations were accomplished in the first outbreak which appeared to belong to O group 139. Doctor Ewing later identified one of these as O 139. Three weeks later a second outbreak occurred in the same herd. Cultures were made from one pig, the organism isolated being identified as a member of O group 46. The third expression of the disease involved a herd of younger pigs which were being used in an experimental test described in a later paragraph. In this instance organisms of O group 138 were isolated from cultures involving two pigs.

Another farm had three outbreaks of *E. coli* toxemia within a ten-day period in three separate herds. Cultures were made from one pig in each of two herds, and the organisms isolated were identified, respectively as belonging to O groups 138 and 139. Unfortunately, dead pigs in the third outbreak were not cultured. A third farm experienced two outbreaks in two separate herds within a seven-month period. Isolations were identified as O groups 5a, 5b, and 138.

Active Immunity with a Bacterin

This experiment involved a herd of 34 eight-week-old pigs which were the progeny of four Tamworth sows. Two of the sows

had been bred to a Tamworth boar and the others to a Hampshire boar. Approximately half of the pigs were of Tamworth type and color, whereas the others resembled the Hampshire breed. A formalized bacterin with a density of approximately 150 McFarland nephelometer was prepared from the first subculture of an O group 139 isolation. Subcutaneous injections of 2 ml. were made into 17 of the 34 pigs, care being exercised to include in the principal group approximately equal numbers of the two types of pigs. In seven days the pigs were castrated and weaned; at nine days the pigs were vaccinated with hog cholera antiserum and virus, and dosed orally with 5 ml. of a saturated solution of $NaHCO_3$ and 5 ml. of a 24-hour broth culture of hemolytic *E. coli* O group 139. Sixteen days after the administration of the bacterin, one treated and one control pig died of *E. coli* toxemia. Another control pig died two days later. All pigs were of Hampshire coloration. Cultures were prepared from the first two pigs and hemolytic *E. coli* O group 138 was isolated from each.

Sensitivity of Hemolytic E. coli

Since antibiotics and sulfonamides are widely used in the control of many bacterial infections, it was deemed important to determine the possibility of the control of *E. coli* toxemia with such products.

Eight agar plates were seeded with eight different strains. The cultures included three strains of O 139 and one strain each of O OX11, O OX12, O 8, O 5a, 5c, and O 138. Ten different antibiotic discs of medium concentration (Difco) were placed on the surface of each plate. Following incubation for 24 hours, it was determined that all cultures were highly sensitive to dihydrostreptomycin, neomycin, and chloramphenicol. The other antibiotics, penicillin, tetracycline, oxytetracycline, chlortetracycline, polymyxin B, bacitracin, and erythromycin had either insignificant or no effect. At a later date, three cultures were tested for sensitivity to nitrofurazone discs (Baltimore Biological Laboratory), and this substance was found to be highly inhibitory.

In an experiment designed to test the inhibitory effects of sulfonamides against hemolytic *E. coli*, 13 strains were seeded to tubes of heart infusion broth containing 10 mg. of sulfathiazole sodium per milliliter of broth. Observations at 24 and 48 hours, and comparisons between the sulfonamide and control tubes, showed that in every instance there was marked inhibition of growth in the sulfonamide tubes. A similar experiment in which sulfamethazine sodium was substituted for sulfathiazole, provided identical results.

Field trials in which sulfathiazole sodium was administered in drinking water were made in five large swine herds. In each instance medication was started following initial discovery of the disease. Further losses did not occur after medication was started.

Serum Antibodies in Pigs

The presence of a high antibody titer against a specific organism is indirect evidence that infection has occurred.

Approximately three weeks following outbreaks of *E. coli* toxemia in two herds of pigs, the serums of seven pigs that had dis-

TABLE 2. Type Specific K Antibody Titers of Incontact Pigs Three Weeks Following E. coli Toxemia

Serum (Pig-Herd)	Age (Wk.)	Serum antigen dilutions 1:10	1:20	1:40	1:80	1:160	1:320
1 A	9	4*	4	3*	2*	1*	—*
2 A	9	4	3	2	1	—	—
1 B	10	4	4	4	4	3	1
				Control pigs			
1 C	6	—	—	—	—	—	—
2 C	6	—	—	—	—	—	—
1 D	16	4	2	—	—	—	—
2 D	16	3	3	2	1	—	—

*4- complete agglutination; 3, 2, 1- degrees of partial agglutination; — no agglutination.

played symptoms but had recovered, were examined for evidence of specific homologous O antibody. An incontact pig from another herd was also examined. All serums were negative at 1:10 and higher dilutions. At a later date, the serums of three incontact pigs from two herds were examined for specific homologous K antibody about three weeks following the appearance of the disease. At the same time the serums of four pigs from two herds where *E. coli* toxemia had not been detected were also examined. The results of this examination are tabulated in table 2.

Fig. 3. Edema of the gall bladder in experimental *E. coli* toxemia. The wall of the gall bladder is ½ in. thick.

Fig. 4. Edema of the stomach in experimental *E. coli* toxemia.

Discussion

It would appear from the examinations of hemolytic *E. coli* isolations accomplished that a number of different serotypes may be involved in *E. coli* toxemia. In this study isolations were examined from 23 different outbreaks. Although the numbers involved were too small to establish conclusive patterns, the 70% of the isolated organisms represented by O groups 138 and 139 indicated that these serotypes were of the greatest importance. Not only did they appear most frequently, but they were also involved in all of the severe outbreaks studied. Sojka, Erskine and Lloyd[9,14] studied a greater number of hemolytic *E. coli* isolations and found that only three serotypes occurred commonly. Approximately 90% of the outbreaks studied by these researchers were covered by three common types. In the outbreaks studied in connection with this report involving cultures from two or more pigs, only one serotype was recoverd in any one case.

With mounting evidence indicating that an infectious agent is involved, it is disconcerting to find that different serotypes of hemolytic *E. coli* were isolated on farms experiencing multiple outbreaks. From these data, it may be logically assumed that *E. coli* toxemia is not contagious in the sense that the word is ordinarily applied, but is a disease which results when certain *E. coli* serotypes accidentally find favorable conditions for growth. Apparently, favorable growth conditions for O group 139 did not exist when the experimental herd of 34 pigs was dosed orally with broth cultures. This serotype did not exist or was present only in limited numbers in the two pigs that were cultured seven days following oral administration of the organisms. Organisms of O group 139 were not recovered from the intestines of either pig cultured.

In view of the fact that three antibiotic preparations, nitrofurazone, and two sulfonamide drugs effectively prevented normal multiplication of the *E. coli* strains tested, it was felt that the administration of such products early in an outbreak would be highly desirable and would materially reduce mortality. In five instances, pigs were medicated with sulfathiazole sodium shortly after the existence of outbreaks was discovered. Although it is highly probable that the medication was responsible for the rapid termination of mortality, the disease is so highly variable in respect to losses that it seems unwise to draw definite conclusions. On the basis of clinical evaluation, Austvoll[15] has recommended certain sulfonamides in the prophylaxis and treatment of *E. coli* toxemia. Lemcke, Bellis and Hirsch[6] also tested a number of E. coli strains isolated

from affected pigs for antibiotic sensitivity. These strains were sensitive to chloramphenicol and neomycin but were resistant to chlortetracycline and oxytetracycline.

It appears that an increased specific homologous K antibody titer occurs in animals which are present in affected herds. No evidence has been found of increased specific O antibody in animals which had recovered from the disease.

Reports by Briggs *et al.*[13] and Ingram *et al.*[13] indicate that specific K antibodies in colostrum are factors essential for calf survival in the face of certain *E. coli* intestinal infections. It appears logical, then, that the development of specific K antibody titers in pigs may be factors in preventing outbreaks of *E. coli* toxemia.

Summary

1. A report involving the O and H antigen composition of 25 strains of hemolytic *E. coli* isolated from 22 outbreaks of *E. coli* toxemia is presented. Dr. W. H. Ewing, U. S. Public Health Service, was responsible for organism typing.

2. One O antigen group of *E. coli* appeared in almost half of the isolations. Eight O antigen groups were identified.

3. Two farms experienced multiple outbreaks of *E. coli* toxemia within short periods. Different serotypes of hemolytic *E. coli* were isolated in different outbreaks on the same farm.

4. An attempt was made to produce immunity by injecting pigs with a bacterin. Immunity was challenged, by an oral dose of living organisms of the same antigenic composition. Both control and challenged pigs developed *E. coli* toxemia, but the organisms isolated from the dead pigs were not of the same O group as those administered orally.

5. Eight hemolytic *E. coli* strains were tested for sensitivity to antibiotics. All strains were highly sensitive to neomycin, chloramphenicol and dihydrostreptomycin. Thirteen strains were subjected to the inhibitory effects of two sulfonamides. All strains tested were inhibited to a marked degree. The growth of three strains was inhibited by nitrofurazone.

6. Serological tests were conducted on the serums of recovered and incontact pigs for the purpose of determining the titers of specific O and K antibodies. There was no evidence that recovery from *E. coli* toxemia resulted in a buildup of specific O antibody. The existence of measurable specific K antibody in the serums of incontact pigs was suggestive of response on the part of the animals to association with the pathogenic *E. coli* isolated.

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The poignant scenes depicted below were exhibited in the VETERINARY MEDICINE *booth at the A.V.M.A. convention at Cleveland, 1957. Artist Mary Ellen Cross based this pathetic record of winter starvation in rural areas and unsanitary conditions in towns on a narrative by Doctor Smithcors. Abstract of this paper which was presented at the 30th annual meeting of the American Association for the History of Medicine, Williamsburg, Va., June 6, 1957, appears below.*

ROOTS OF ANIMAL DISEASE IN COLONIAL AMERICA

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Inasmuch as no domesticated animals existed in America before the coming of the white man, those brought by the early settlers were placed into what amounted to a disease-free environment. This, plus the insular immunity provided by the small scattered settlements and poor transportation, afforded a temporary but deceptive immunity to the great plagues which had ravaged Europe for centuries. Relatively few animals were imported because of the cost of transport, but with an abundance of forage, and a modicum of attention, livestock increased prodigiously in numbers. Until feed became scarce as settlements increased in size, and land was worn out by continuous cropping, the chief hazard to animal safety appears to have been marauding Indians rather than disease.

In all times, freedom from disease has bred complacency toward it, and colonial America was no exception. While the major animal plagues which began to darken the horizon in the early 19th century were imported from Europe, the stage had been set for their effective entrance by the indifference of the people to the fundamental concepts of decent animal care. Famine and filth were major factors in the increasing toll of animal plagues. Increasingly greater numbers of livestock were expected to forage for themselves during the cruel winters on land which had become impoverished. In rural areas, animals left to their own devices perished by the thousands, or were left in a weakened condition, ripe for the invasion of disease. In the towns, hogs had the run of the streets, and vied with dogs for the position of street scavengers. Long after towns had become cities, hogs—live and dead—were a major problem in both animal and human health.

Phenylbutazone Therapy In Horses

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THIS is a preliminary report on butazolidin® therapy of lamenesses in horses. Butazolidin, 3,5-dioxo-1.2 diphenyl-4-n-butyl-pyrizolidine, commonly known as phenylbutazone, has been phenomenally successful in treatment of canine lamenesses, posterior paralyses, arthritis, and allied musculoskeletal disorders, as well as encouraging fracture patients to make early use of affected limbs. Butazolidin's effectiveness in treatment of dogs prompted several practitioners to use similar therapy on horses with the presently marketed small animal product. An attempt to answer questions pertaining to the use of butazolidin in horses forms the basis for this report.

Drug History

Phenylbutazone was synthesized by the Geigy Chemical Corporation (Switzerland) and introduced into human medicine in 1949, where clinical effectiveness was proved by various workers.[1,2,3,4,5,6] Laboratory workers[7,8,9,10] have shown that the drug has antipyretic, antirheumatic, anti-inflammatory, and analgesic action. Toxicity studies in laboratory animals and dogs have been published,[11] and clinical effectiveness in dogs has been demonstrated.[12,13,14] Camberos,[15] who used butazolidin to treat 50 horses in Argentina, has reported the following observations:

"Butazolidin should be used intermittently and not continuously and should be administered 24 hours before requiring special effort from the animal. Most favorable results are obtained in cases of arthritis or chronic arthrosis (*e.g.*, osteoarthritis of medial and distal bones of the hock, arthritis of stifle and hip, arthrosis of spine, chronic hip pains, chronic pain in trapezius muscles, and generalized arthritis). Results are not as favorable in cases of traumatism, muscle rupture, strains, et cetera, and in inflammations of the third phalanx." Because of the Thoroughbred's delicate liver, he believes it imperative to check renal and hepatic functions before treatment is initiated.

Case Reports

No. 1. A seven-year-old roan-colored Tennessee Walking Horse, weighing approximately 1,300 lb., had suffered a severe wire cut which extended both laterally and medially across the anterior aspect of the hock. This injury had occurred about one year previous to the initiation of treatment. During the long healing period, the horse favored its wounded leg with resulting lameness in all four legs. Because the animal was overweight, this secondary lameness did not get better as the wire cut healed. The horse was so lame that it could not be ridden. It moved haltingly with short painful steps, and experienced extreme difficulty when forced to cross-over in front. Since cold, damp weather had a forceful detrimental effect, the condition was diagnosed as secondary lameness, probably arthritic in nature, affecting all four limbs.

Beginning June 25, the horse was given butazolidin orally at the rate of 1 gm. per day. On July 9, since the lameness had not responded to the degree expected, the dose was doubled and continued at 2 gm. per day until September 4. Since blood

®Geigy Chemical Corp., Switzerland.

TABLE 1. Red and White Cell Counts and Hemoglobin Content of Horse Blood During Butazolidin Therapy

Date	WBC	Hb. gm./100 cc.	RBC
Jun. 25, '57	12,100	12.5	—
Jul. 2, '57	—	11.5	—
Jul. 9, '57	9,100	11.0	—
Jul. 17, '57	7,230	11.5	—
Jul. 24, '57	8,250	11.5	—
Aug. 1, '57	10,750	11.5	5,870,000
Aug. 9, '57	11,350	10.0	5,940,000
Aug. 14, '57	9,350	12.0	5,800,000
Aug. 20, '57	9,350	10.0	6,090,000
Aug. 29, '57	8,350	11.0	5,500,000
Sep. 4, '57	8,950	11.0	6,850,000
Sep. 10, '57	10,300	11.0	6,320,000
	*11,000	*8.5-11.5	*6,900,000

*Normal range according to Duke's Physiology of Domestic Animals.

dyscrasies sometimes occur in man on butazolidin, blood counts were made weekly. Results have been tabulated in the accompanying table.

From July 10 until September 10, the gelding was free from lameness, except that the limb with the wire cut, was slightly stiff due to ankylosing of the bones in the hock. On cold, damp days the horse exhibited slight lameness, but since blood counts were being tabulated on a certain dose schedule, no attempt was made to increase the dose to combat the symptoms. No side effects were noted at any time; the horse ate well and all eliminations appeared normal. It was anticipated that the lameness would recur upon cessation of drug administration, but at the time of this report, December 31, it remains free from pretreatment symptoms.

No. 2. A registered Quarter Horse mare, weighing about 1,200 lb., 10 years of age, and two months pregnant, had been severely kicked in the anal and vulvar regions. Examination of the vagina disclosed a bruised area extending anteriorly to, but not including, the cervix. The mare was unable to rise without assistance, and exhibited poor coordination when forced to walk. It was placed on 2 gm. butazolidin per day for five days. Forty-eight hours after initiating butazolidin therapy, the mare was able to get up without assistance, but the animal's gait suggested continued soreness. Recovery was gradual with no relapse after termination of medication on the fifth day. It is impossible to state in a definitive manner the degree butazolidin benefited recovery, but the owner was impressed, and it is felt that the chemotherapeutic was of benefit.

No. 3. An American Saddlebred gelding, 19 years of age, weighing about 1,050 lb., suffered a nail puncture wound extending through the sole dorsally toward the coffin bone. The nail was removed, antiseptic applied locally and the foot bandaged. A total of 1,000,000 units of penicillin and 2,500 units of tetanus antitoxin were administered. In an attempt to relieve pain and keep this aged horse comfortable, butazolidin was dispensed with directions to give 2 gm. per day for two weeks. Due to a misunderstanding, the caretaker gave 4 gm. per day. Prior to treatment, the horse would place no weight on the involved limb; afterwards it would bear a limited amount of weight on the hoof. This case bears out Camberos'[15] observation that involvement of the third phalanx responds poorly.

No. 4. A 460 lb. Shetland Pony gelding, seven years of age, suffering from chronic founder, was given 1 gm. per day for two weeks with fair to poor results.

Summary

Four different equine lameness cases have been treated with butazolidin. Response was gratifying in a severe case of chronic arthritis; good in a posteriorly bruised trauma case; fair in a wound involving the coffin bone; and questionable in a chronic founder case. The last two cases were not treated with any expectation of success. Treatment was beneficial and dramatic, however, in the case of chronic arthritis. Based on the experience of others and the cases reported here, butazolidin is indicated as supportive or adjunctive therapy in equine lamenesses due to generalized arthritis, spavin, arthritis of stifle or hip, arthrosis of the spine, and perhaps many others. However, little or no relief may be gained in cases involving the coffin bone, or the region of the third phalanx in general. At no time was toxicity or any other side effect in evidence.

Conclusion and Comments

Butazolidin, a new drug in equine practice, deserves a place in the therapy of lamenesses. Certain conditions have responded dramatically, whereas others have not. These latter cases appear to be limited to lameness caused by inflammation or injury to the most distal bone of the limb. Further study of butazolidin is indicated due to etiologies and anatomical locations that may be involved. The dosage appears to vary from 1 to 2 gm. per 500 lb. body weight; however, as in canine therapy, it appears that the condition, rather than the body weight, is the determining factor. In all cases that have responded to butazolidin therapy, results have been achieved dramatically and within a short period, usually from one to four days. At the present time, a low dose is recommended particularly when long periods of medication are contemplated. Side effects, in other species, indicative of toxicity are diarrhea, blood dyscrasias, symptoms of peritonitis, and impaired renal and/or hepatic function.

INCOME TAX

The Spring Dilemma

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THE YEAR 1957 has passed. As to the tax on income for the year, all that remains is preparation of a return and payment of the tax or recovery of overpayment.

In an effort to satisfy the tax obligation to the government, many a practitioner will burn the midnight oil in the 104 nights between January 1 and April 15. In certain cases the Internal Revenue Service will grant a 90 day extension if an acceptable reason for inability to file on time is presented. Lack of funds with which to pay the tax is not an acceptable reason, even though it may be a good one. In cases of inability to pay the tax, a return without payment should be filed to avoid penalties for failure to comply with the law.

Avoiding vs. Evading Tax

There is quite a distinction between "avoiding" and "evading" taxes. The first is legal and the second is criminal. The Internal Revenue Code of 1954 delineates the tax liability, and every taxpayer should take all credits to which he is entitled.

The income tax return must flow from the records and not vice versa. Many cases of income tax woe have been occasioned by inept examples of "this is the return upon which I base my figures."

The 1957 Form

Practitioners now concerned with preparation of their 1957 income tax return should first give attention to schedule "C" of form 1040, Profit (or Loss) from Business or Profession. The net profit (or loss) that will appear in line 23 on completion of this form is entered on line eight, page one of the tax return, form 1040. It must be noted that no personal deductions are entered in this schedule. Expenditures for personal deductions should be entered on page two of the income tax return, form 1040.

In entering deductions on schedule C, care should be taken to see that all expenses pertaining to the practice are included. The depreciation deduction is allowable on either the cash or accrual basis. No bad debt deduction is allowed on a cash basis return.

To ascertain the amount of depreciation to be shown on line 17, page one of schedule C, schedule C-1 (on the lower part of page one, schedule C), should be completed. All capitol items used in earning the income should be listed. If depreciation has not been taken on an item owned and used in prior years, the depreciation has run against it even though it has not been taken into

account, and the amount accordingly should be entered in column 4 of schedule C-1. As a guide in calculating depreciation, Internal Revenue Bulletin F lists the average useful life in years. Items that may be of interest are shown in Bulletin F to have an average useful life in years as follows: Passenger automobiles used commercially —5; salesmen automobiles—3. Office equipment has been found to have a composite life of about 15 years; or safes—50; furniture, fixtures and filing cases—20; mechanical equipment—8. Specific items are listed as typewriters—10; billing machines—8; adding machines—10; bookkeeping machines—8; check writers—8; electric vacuum cleaners—6; electric fans—10; professional libraries—30; scientific equipment used by veterinarians—10.

In calculating depreciation under the "straight line method" the cost or other basis of the property, less its estimated salvage value, is deducted in equal annual installments over the period of its estimated useful life.

The Internal Revenue Code of 1954 provides for use of the "declining balance" method and "sum of the years digits" method applicable to new property acquired or completed after Dec. 31, 1953. The taxpayer must be the original user of the property and the property must have a useful life of three years or more.

Under the declining balance method, the rate used must not exceed twice the straight line rate for property new, in use, acquired, or completed after Dec. 31, 1953. The greatest amount of depreciation is taken in the first year of use; in each subsequent year the depreciation previously taken is deducted from the basis of the property before applying the rate. Therefore the rate is applied to a constantly declining balance and the depreciation deduction is in a lesser amount each year. The salvage value is not deducted before applying the rate. The taxpayer may change from the declining balance method to the straight line method without obtaining permission from the Commissioner of Internal Revenue for the change. A statement regarding the change should be attached to the return.

TABLE 1.

Year	Rate %	Bal.	Annual deprec.
1	40	$1000.00	$400.00
2		$ 600.00	$240.00
3		$ 360.00	$144.00
4		$ 216.00	$ 86.40
5		$ 129.60	$ 51.84

Depreciation Example

Property with a cost value of $1,000. and an estimated useful life of five years would be depreciated under the declining-balance method, as illustrated in table 1.

The undepreciated balance of $77.76 remaining at end of the five years represents the salvage value.

Under the sum of the years digit method the annual depreciation deduction is calculated by applying a changing fraction to the cost of the property after deducting the estimated salvage value. This method may be used only for property similar to that for which the declining balance method may be used. In the fraction used each year the numerator is the member of remaining years of the estimated useful life of the property and the denominator is the sum of the numbers representing the years of useful life of the property. For property with an estimated useful life of five years that cost $1,500., with no salvage value, the depreciation is computed as illustrated in table 2.

TABLE 2.

Year	Deprec. rate	Annual deprec.
1	5/15	$ 500.00
2	4/15	$ 400.00
3	3/15	$ 300.00
4	2/15	$ 200.00
5	1/15	$ 100.00
15		$1,500.00

It is apparent that the liberalized depreciation under the declining-balance and sum of the years-digits methods results in a larger deduction in the earlier years over the straight line method. By any method the total depreciation deduction can not exceed the cost of the property.

Continued on page 10

SMALL ANIMAL PRACTICE

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An outbreak of rabies occurred among wildlife in Alberta in 1952. It spread raidly from north to south due to migration of foxes seeking more plentiful food supply. Control measures invoked during this epizootic are discussed in this article essentially as presented by Dr. E. E. Ballantyne at the Eastern Iowa Veterinary Association Convention, Cedar Rapids, October 17, 1957.

Rabies Control In Alberta Wildlife

E. E. BALLANTYNE, D.V.M.

Director, Veterinary Service Branch
Alberta Department of Agriculture
Edmonton, Alberta

THE history of rabies in the Northwest Territories and the Yukon, a vast sparsely settled territory of approximately 1,551,030 square miles, is vague, but probably goes back to late in the 19th century. During the 1930's, reports came out of this northern area of a disease condition affecting sleigh dogs and wild animals. The natives called it "Artic dog disease," and signs indicated involvement of the central nervous system. Dogs apparently developed the disease after being bitten by foxes or wolves.

Due to distances and difficulty of transportation, no specimens satisfactory for laboratory examination were shipped out until 1947. Plummer[1] was advised that this disease condition existed at Baker Lake in the Northwest Territories, 400 miles north of Fort Churchill, Manitoba. He flew in, obtained the heads of three dogs and a fox and subsequently proved that the disease was actually rabies.

Since that time rabies has been diagnosed in the western, eastern, and central parts of the Territories and in the Yukon. Reactions in foxes, wolves, lemming, and a caribou, in addition to dogs, have been positive. In 1948, a positive diagnosis was made in material from Cambridge Bay; in 1951 from Lake Harbour, Fort Smith, and also Fort Churchill in Manitoba. In 1952 more areas of the Northwest Territories were found to be involved. These included Taktayaktuk, Yellowknife, Fort Rae, Fort Smith, Fort Macpherson, and Fort Resolution; also Summit Lake in the Yukon. Thus it was evident that the disease was enzootic throughout the entire vast Northwest Territories and that wildlife provided the reservoir of infection. This source of infection has had widespread effects in Canada since 1952. One of the most serious outbreaks raced across Alberta that year, presenting livestock growers as well as the general population with a dangerous problem. How this challenge was met provides the basis for this report.

The Alberta Outbreak

The scope and magnitude of the Alberta rabies outbreak and the control measures invoked may best be understood by first considering the geography of the province. Alberta is a land-locked province extending approximately 750 miles from Montana on the south, to the Northwest Territories on

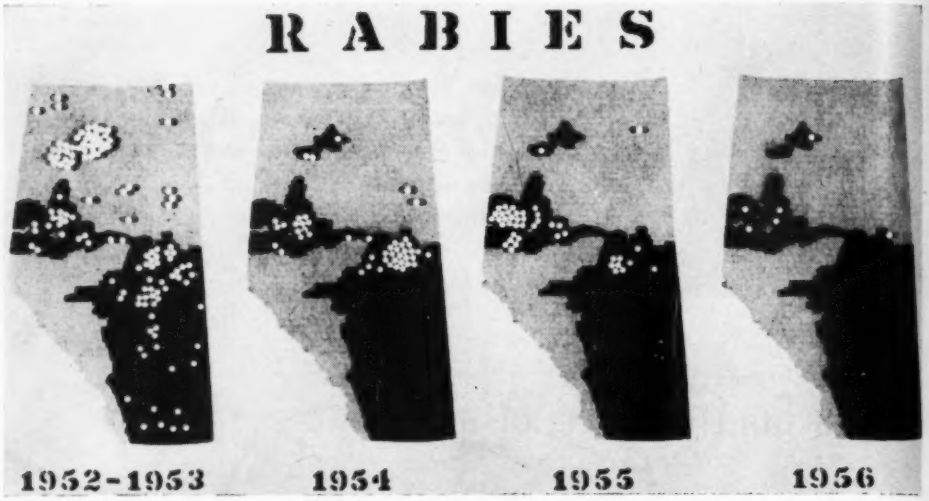

Fig. 1. Each dot indicates a proved rabid animal. No positive cases have been diagnosed since May 1956; over 100 heads of suspected cases have been examined since then, but all were negative.

the north, and a distance varying from 200 to 400 miles from British Columbia on the west, to Saskatchewan on the east. The north-south distance is slightly greater than the distance from New York to Chicago. The area is 255,285 square miles, approximately half of which is forest, particularly in the north and along the eastern slope of the Rocky Mountains. The remainder is farm land, varying from wooded and semi-wooded country to bald prairie in the south-east.

North of Alberta the red, black, and cross-bred fox population had been increasing for several years and reached its apex in the fall of 1952-53. Due to the decline in popularity of fox furs, there had been almost no depletion by trappers. According to Rowan,[2] the density of the fox population in the Northwest Territories in 1952 was the highest ever known to biologists in North America.

As a result of an inadequate food supply and general overpopulation, rabid foxes moved south and west from August to April.

Results of the extensive rabies control program in Alberta that followed are graphically evident in figure 1. No case of rabies has been diagnosed during the past 1½ years. Such rewarding results are further emphasized by the fact that the disease entered the province from the Northwest Territories in June 1952, and spread south over 750 miles by the following spring. By 1955 the disease had been pushed back 400 miles, with a few cases remaining evident further north up to May 1956.

No human cases of rabies were reported. Approximately 200 individuals were given the Pasteur treatment due to dog bites, cat bites and scratches, exposure when skinning rabid animals, scratches from a rabid lynx, exposure when unknowingly treating rabid cattle, et cetera. Excellent control discipline resulted from an educational program that advised exposed individuals of appropriate action. Reduction in the number of carriers and rabid animals in the infected wildlife population provided the main feature of control. However, enforced dog quarantine laws and vaccination regulations were almost as important.

All these segments of the control program were coordinated and directed by the Alberta Central Rabies Control Committee. Members represented the Alberta Department of Agriculture, the Federal Department of Indian Affairs, the Federal Department of Agriculture, the Alberta Department of Lands and Forests, the Royal Canadian Mounted Police, the Alberta Department of Health, the Alberta Veterinary Medical Association, and the Medical Officer of Health for the city of Edmonton. The Committee operated as a quasi-official

TABLE 1.

Foxes	55,889
Coyotes	53,364
Lynx	10,044
Wolves	5,461
Bear	4,130
Skunk	664
Cougar	69
Fisher	18
Badger	4
Wolverine	1

entity. It embodied no legal authority other than the authority vested in its member organizations. It nevertheless instilled in the public the confidence that can come only when physicians and veterinarians, law enforcement officers and predator control officers all work as a unit.

Control Methods

Wildlife control methods in both the agricultural and forest areas were outlined and illustrated at civic meetings with colored slides.[5] In forest areas, a double line, five miles apart, was established along the margin of the farming area. In the far north, single lines fanned out from the small farming communities of Keg River and Fort Vermilion. By March 1, 1953, approximately 5,000 miles of traplines were in operation, with 151 trappers at work in the peak of the winter and spring of 1953. During the summer the formal lines were not adhered to, however. Trappers worked back into the forest as deep as 40 to 70 miles to find dens. Gradually the staff was reduced to a few trappers still required in each Forestry Division to work over pockets of predators. At present only two such trappers are employed to concentrate on packs of wolves.

The forest area program was carried out by the Forest Rangers of the Alberta Department of Lands and Forests. Trappers used strychnine pellets, snares, and traps, with the first two named the principle depopulation methods. The program in the farming areas was supervised by the Alberta Department of Agriculture and was directed primarily at the coyote, the main carrier of the disease to domestic animals. Municipalities appointed pest control officers and in unorganized marginal areas the Department employed such officers. Farmers used cyanide guns, strychnine pellets, traps, and hunted by dogs, from airplanes, or on horseback. The Department, at the request of municipalities, used "1080" in sparsely settled areas.

Table 1 shows the depopulation results in the forest areas from October 1952 to February 1956. Most of the kills reported were made from 1952 to 1954.

Table 2 shows the supplies used and coyotes killed in the agricultural areas, 1951 to 1956.

Table 2 also graphically illustrates the excellent results that can be achieved by a well publicized rabies control program coupled with an organized method of orientation, and adequate distribution of poison materials. The yearly average of 10,350 coyotes killed in 1951 and 1952 before rabies reached the main agricultural areas of the province provides a marked contrast to the average of 56,520 in each of the four subsequent years when rabies control was the key objective. It shows also that people will work for the common good to protect themselves, their livestock, and pets.

It should be pointed out that poisons were not thrown around indiscriminately.

TABLE 2

	1951	1952	1953	1954	1955	1956	Totals
Coyote getters	5,560	4,530	18,000	5,410	4,080	1,580	39,960
Cyanide cartridges	11,510	12,460	46,030	20,110	10,990	5,000	106,100
Scent (2 oz. jars)	1,050	1,350	8,120	7,370	6,340	3,330	27,560
Strychnine pellets	0	0	116,000	192,000	195,500	124,500	628,000
"1080" baits	50	161	174	382	379	753	1,899
Estimated coyote kills	8,400	12,300	56,300	62,100	57,200	50,500	246,800

Both in forest and agricultural areas, the locations were marked and accurate records kept.

The kill figures were sizeable but it must be remembered that only a small part of the forest areas was worked over, and also that an estimated 200,000 coyotes inhabited farming areas. Peak populations were not prolonged as feared by some, nor was there destruction of many valuable fur-bearing animals.

Bounties were not paid because it was deemed unwise to stimulate contact with infected animals, thereby increasing the number of people taking the Pasteur treatment. Previous experience with a coyote bounty in Alberta proved costly and unsatisfactory.

Public Relations

Full use of the press, radio, meetings, posters and bulletins was made. Positive diagnosis in a locality was dramatized at meetings, through the press, or over the radio. Full details of a local case prompted ready acceptance of information on appropriate action in cases of human or animal infection by a rabid animal. Farmers were urged to help depopulate coyotes. Physicians, veterinarians, and pest control officers took part in the program at such meetings.

In one municipality, for example, this approach raised the number of farmers participating in coyote control from 200 to 600 in four months. In Athabasca approximately 30 meetings were held. Over 50% of the farmers took training in coyote control methods. A bulletin was published and distributed; a copy went to every schoolroom.

Since dogs can be bitten by rabid animals, and thus be dangerous to humans, domestic animals, and other wildlife, the Federal Department of Agriculture vaccinated all dogs north of the 55° north latitude. The program was organized by the District Agriculturists (same as county agents) of the Provincial Department in order to facilitate speedy accomplishment of the vaccination program. South of 55° north latitude, vaccination was voluntary at the owner's expense. Clinics were organized in a great many centers.

Rabies is a reportable disease, therefore the Federal Department of Agriculture placed a quarantine law on dogs. To provide more law enforcement officers, the Alberta Government asked all municipalities, both rural and urban, to pass dog control by-laws which included the destruction of strays. These laws were strictly enforced, regardless of whether dogs were vaccinated or not. In the Peace River and Edmonton sub-divisions of the Royal Canadian Mounted Police, 4,677 actions were taken against dog owners in a three-year period. These included prosecutions and warnings. At least 657 dogs were killed. Not included in the above actions were numerous prosecutions taken by municipal authorities. For instance, in the winter of 1952-53, the city of Edmonton fined several hundred dog owners. Approximately 1,200 dogs and 1,000 cats were destroyed.

To facilitate submission of specimens in a safe manner, suitable metal containers (5 gal. metal cans) were made available at many locations throughout the province, particularly with veterinarians, the R.C.M.P., and forest rangers. History forms were distributed, along with disinfectants and heavy rubber gloves. The public was advised to call qualified help and not to remove the heads of infected animals them-

Fig. 2. Dog bitten by rapid fox exhibiting signs of rabies.

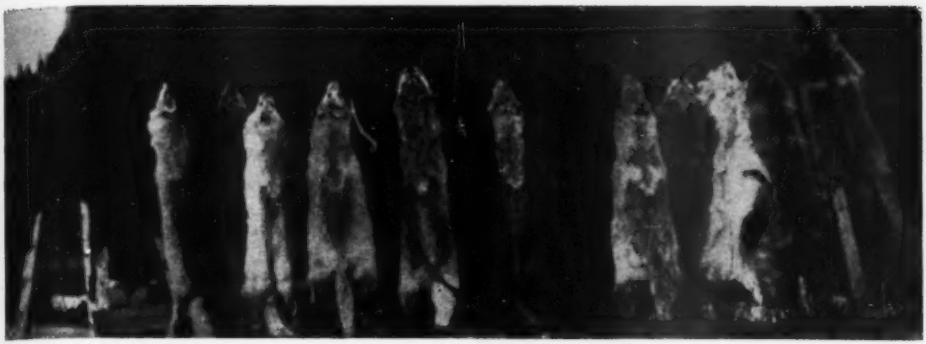

Fig. 3. Wolves killed by trapline east of Jasper National Park.

selves. This eliminated another potential source of danger to humans. The above personnel were responsible for investigations of suspected cases.

Proved rabid wildlife were wolves, foxes, coyotes, bears, lynx, weasel, beaver, a rabbit, and a moose. They infected cattle, hogs, sheep, dogs, cats, and horses. Incubation periods in domestic animals due to fox, wolf, and coyote bites were described and veterinarians were urged to keep accurate records to further knowledge on this aspect.

In Alberta the seasonal peak for rabies in wildlife and domestic animals was January to April. Coyotes were the main disseminators of the disease in agricultural areas.

A system of forecasting potentially dangerous areas a year in advance was developed based on the concentration of rabbits which attracted foxes, coyotes, etc. for food.

The need for a great deal of research on sylvatic rabies was emphasized.

The control program was costly, particularly to the Alberta Government, which paid most of the bill. Results in protecting humans and livestock outweighed many times the expense in dollars and cents. No human cases occurred; people now are not living in continual fear of the disease; livestock is protected; and big game has increased.

Officials in Alberta are of the opinion that a well planned and executed wildlife depopulation program had a beneficial effect in controlling rabies under prevailing local conditions. To have adopted an attitude of "can't do anything" would have been difficult to justify especially when the public were subject to its first experience with the disease.

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Diagnosis of Esophageal Obstruction in the Dog

The use of barium sulfate capsules in the diagnosis of blocking or obstruction of the esophagus in the dog or cat is discussed informatively by Holt in the September 21, 1957 issue of *The Veterinary Record*. The author discusses first the methods employed other than the barium sulfate capsule; such as the use of the endoscope, which requires preliminary anesthesia and straight radiography which could miss a nonopaque foreign body or strictures.

He recommends barium sulfate, 5 gr. contained in a gelatin capsule administered orally. If the capsule passes on to the stomach an unobstructed esophagus would be confirmed. Radiography or fluoroscopy following administration will assist in clarifying situations such as obstruction or lodging at any point of the esophagus.—*R. R. Dykstra, D.V.M.*

CANINE CAVALCADE . . .

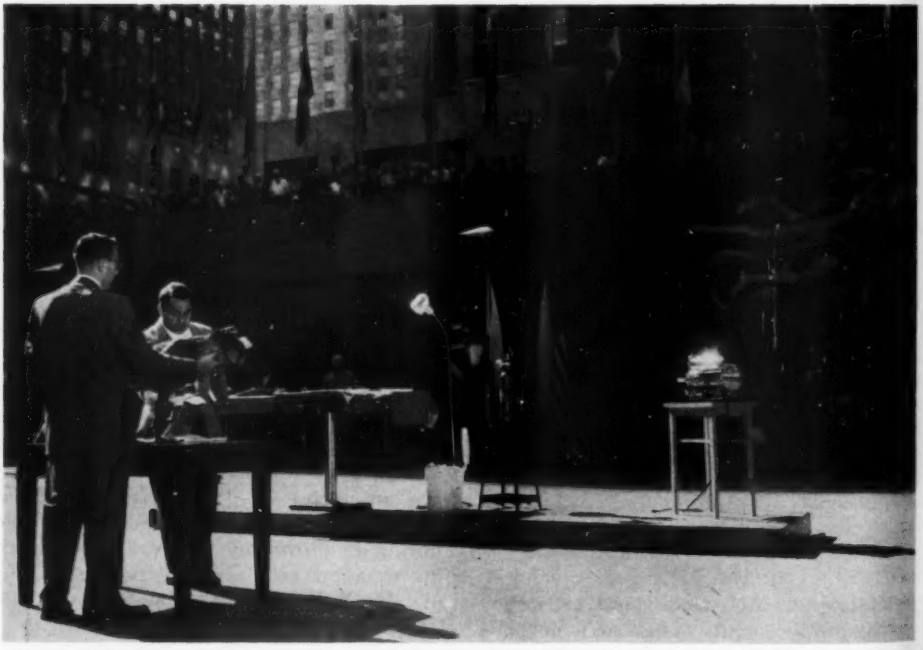
Tribute to the Dog Doctor

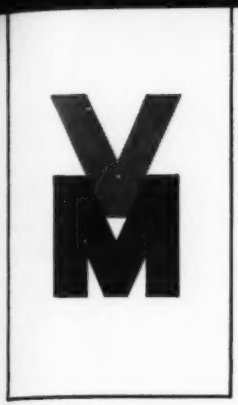
NEW YORK CITY'S oldest practicing veterinarian, Dr. Robert S. MacKellar, Sr., 82, was awarded "Tribute to the Dog Doctor" in the 13th annual Canine Cavalcade in the Lower Plaza at Rockefeller Center. Brigadier General Wayne O. Kester, former chief, Veterinary Services, U.S.A.F. (left) presented the award on behalf of the Veterinary Medical Association of New York City, which recognized Doctor MacKellar's 63 years of active service to dogs.

Other events in National Dog Week salute included Dog Training for Modern Living illustrated by poodle obedience exercises, German Shepherds demonstrating the Many Uses of a Dog, Dogs in the News featuring canine headline winners, and the colorful pageant Around the World of Dogs in 20 minutes, and a brief demonstration of first aid to an injured dog (below).

Also exhibited as part of the veterinary program was a typical small animal hospital unit.

Miss Edith Adams, star of the Broadway musical hit, Li'l Abner, was mistress of ceremonies.





Filth is almost ever-present and probably a contributing factor in many skin disorders of dogs. In this an agent possessing desirable therapeutic properties, in addition to serving as a cleansing agent, is recommended for selected cases.

Seborrheic and Eczematoid Dermatosis of Small Animals

SOL MICHAELSON, D.V.M.

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THE differential diagnosis, choice of treatment and eventual cure of various canine dermatoses present a continuous challenge to the small animal practitioner. Of the many forms of dermatitis, the etiology of which are complex and uncertain, the two broad categories of eczematoid dermatitis and seborrhea will be considered in this report. Although there is some opposition to the use of the term eczema, this is retained in deference to common usage.

The clinical picture of "eczema" is quite variable but usually takes the form of an inflammatory change of the superficial layers of skin and is characterized by erythema, papules, vesicles, pustules, bulla and/or a serous discharge leading to the formation of scales or crusts. These changes are usually accompanied by severe itching. The moist form of this condition is one of the most difficult to treat due to its persistence, acute discomfort, and tendency towards recurrence.

Disturbances in function of the sebaceous glands of animals may produce an increased oily secretion resulting in the skin condition known as seborrhea.[7] In the dog, this condition gives the skin a greasy consistency and produces a rancid odor.

Little is known about the basic etiology of various canine dermatoses but numerous clinicians are quite convinced that filth is far more often a contributory factor than is realized. In the external treatment of any dermatitis, the first approach is usually that of cleansing.[13] This includes not only the removal of dirt, bacteria, fungi, and chemical irritants, but also softens and separates exudates, crusts, or horny scales.

In recent years metallic salts such as cadmium sulfide and selenium sulfide have been incorporated into shampoos for the treatment of dermatoses. The toxicity of cadmium and selenium for animals are too well known to veterinarians to warrant repetition.[2,4,6,11,12] In addition to the potential toxicity of selenium sulfide, one must consider the hazard to the veterinarian or attendant who is called upon to give shampoos to several dogs each day during busy seasons. It is quite often impossible to get some attendants to wear rubber gloves when giving shampoos. That excessive exposure to shampoos containing selenium may be

a real hazard can be learned from recent reports in the medical literature on the toxicity of such preparations.[1,5]

The writer who is responsible for the health and care of a large experimental dog colony is constantly on the lookout for preparations which can be used to effectively treat dogs for various maladies in order to obtain a healthy specimen for long term experimentation. It is the writer's opinion that therapeutic agents to be used in treating dermatoses should be effective over a wide range of conditions, easily applied, economical, and with no potential toxicity to the animal or the individual applying the material.

Investigation of a New Agent

In the search for a preparation which might meet these requirements, attention was focused on a formulation* used in human medicine for two years. After some preliminary trials had indicated that this formulation was effective in several different dermatitides in the dog, a similar preparation for animal use** was obtained. This preparation combines the synthetic surface active agents sodium lauryl sulfoacetate, sodium alkly aryl polyether sulfonate and sodium dioctyl sulfosuccinate, which have strong antiseborrheic efficacy. The antiseborrheic and keratolytic qualities of this base are enhanced by the addition of micropulverized sulfur 2% and salicylic acid 2%. Hexachlorophene is added for its antiseptic properties.

The synthetic surfactants used in this formulation are exclusively of the anionic type. They are not precipitated from solution by hard water and are reasonably stable under variations in pH as may occur on the skin. In addition to their ability to promote intimate contact between media not normally miscible, they act as emulsifiers of oily substances. They also have some bactericidal action against Gram-positive bacteria.[10] These surfactants have been used for a long time in dermatology with a record of non-toxicity and low sensitizing or irritating qualities.[3,8]

*Fostex — Westwood Pharmaceuticals, Buffalo, N. Y.

**Fosteen — Westwood Pharmaceuticals, Buffalo, N. Y.

Sulfur has been used by the medical profession as a fungicide and for the treatment of various cutaneous disorders.[4] It enters the skin easily and is reduced there to sulfide and hydrosulfide ions. In this form it exerts its keratolytic and sebum-reducing effects.[6] In addition sulfur is a valuable parasiticide. Sulfur alone or in combination with other keratolytic agents (often 2% salicylic acid) is widely used in the treatment of skin disorders in man such as psoriasis, seborrhea, eczematoid dermatitis, et cetera.

The dermatologic renown of salicylic acid is based on its keratolytic powers and on its role as a pacemaker for sulfur.[6] Salicylic acid is moderately antifungal in concentrations of 2-10%.[3] Used externally, salicylic acid has antiseptic action about equal to that of phenol.[6]

Hexachlorophene in concentrations of 2-5% is considerably active against Gram-positive pathogens and less so against Gram-negative ones. Topical use of this drug has been most successful when it has been incorporated into a variety of soaps, detergents, creams, and oils. Thus it is intended to reduce the number of integumental bacterial flora and finds use in such conditions as carbuncles and seborrheic dermatitis.[9]

Field Trials

In order to substantiate the clinical effectiveness of the product in the treatment of canine dermatoses, 16 small animal practitioners used this preparation in their practice on a variety of cases. A description of the history, treatment and results was maintained on a standard form which was submitted to the author for tabulation and evaluation.

The material was applied as a therapeutic shampoo. The animal was completely wet with warm water. One-half to 2 oz. was worked into the hair and skin of the affected and adjacent areas. Sufficient warm water was added to produce abundant lather and the animal massaged for five minutes. In some cases the lather was left on for 10 to 15 minutes. The hair and skin were then thoroughly rinsed and dried. In most cases therapeutic shampoos were repeated

once daily for two or three days and the material dispensed for home use as required.

In some cases the product was applied as a cream by rubbing a small amount into the lesion. After 24 hours the animal was bathed with warm water with or without the addition of more of the substance.

From personal observation of the author and comments of the cooperating veterinarians and owners of the animals, it is evident that this preparation clears the hair follicles of sebum plugs and scaly debris. It quickly removes scales, crusts, excessive sebum, extraneous contaminants and allergens. This therapeutic shampoo rapidly dries the lesions of moist dermatitis. The skin is left soft and free of objectionable odor, imparting a softness and luster to the hair; this last feature being particularly appreciated by breeders of show dogs.

Of the many conditions treated, the results in three types of dermatitis where this formulation was used as the sole topical treatment are included in table 1.

This product was also found to be singularly effective in treating otitis externa in dogs and as an adjunctive medication in the local treatment of mange and fungous infections. In addition, this preparation has been found to be efficacious in preoperative cleansing of the skin to remove accumulated debris which may occur through neglect.

Cats receiving these therapeutic shampoos tolerated the preparation well which is an important consideration in this notoriously sensitive animal.

TABLE 1

Condition	No. Dogs	Improved	Not Improved	% Improved
Moist "eczema" (weeping dermatitis)	75	74	1	99
Summer "eczema" (dry "eczema")	74	62	12	84
Seborrhea (oleosa, sicca)	54	53	1	98

Summary

An effective treatment for seborrhea and eczematoid dermatoses of small animals is described. A preparation named fosteen, containing a combination of surface active, cleansing, penetrating and wetting agents, enhanced by sulfur 2%, salicylic acid 2% and hexachlorophene 1% has been shown to be effective in the treatment of a variety of skin disorders of the dog. Clinical results obtained in these conditions, manifested by moist or dry dermatitis or seborrhea in dogs indicated an excellent ability to improve the skin condition with no evidence of side reaction or resistance on the part of the animal or attendant.

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Reduced Polio Incidence

An 80% drop in the incidence of paralytic poliomyelitis over the past two years is reported by Marion B. Folsom, Secretary of Health, Education, and Welfare. So far in 1957, 1,576 cases of poliomyelitis have been reported which is compared with 7,886 cases in 1955. Credit is given the wide use of Salk vaccine for reducing incidence of the disease to pre-World War I levels.

Some Current Therapeutic Agents in Veterinary Medicine

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IN AN ARTICLE published approximately one year ago, advances in veterinary therapeutic agents were summarized.[1] During the past year, progress has been rapid and several new agents have been introduced. The present article reviews the most important of these.

Antibiotics

Tetracycline phosphate complex and novobiocin are two antibiotics that attained clinical maturity during the past year. Both are being used systemically in animal patients.

Tetracycline phosphate complex. Tetracycline phosphate complex is the newest salt of the broad-spectrum antibiotic, tetracycline.

Uses. The wide antimicrobial spectrum, including both Gram-positive and Gram-negative bacteria, is essentially the same as for other members of the tetracycline family.

Indications in Dogs. Respiratory tract infections, urinary tract infections, gastrointestinal infections, skin infections, preoperative and postoperative prophylaxis, and certain miscellaneous infections, including those of other soft tissues, coccidiosis and leptospirosis.

Administration and Dosage. Average oral dose for dogs: 10 to 20 lb. — 250 to 500 mg.; 20 to 30 lb. — 500 to 750 mg.; 30 to 40 lb. — 750 to 1,000 mg.; 40 lb. and up — 1,000 mg. to 1,500 mg. These are average daily doses and should be given in equally spaced doses, if possible.

Orally Administered Novobiocin

Novobiocin is a new antibiotic producing peak concentrations in the blood of dogs within two or three hours after oral administration of a single dose. These blood levels, on an equivalent weight basis, are ten times higher than those produced by tetracycline, 25 times higher than those produced by erythromycin, and 50 times higher than those produced by penicillin. High antibiotic levels are present at 12 hours and detectable amounts remain in the serum for at least 24 hours following administration of 250 mg. to the dog.

Uses. The antimicrobial spectrum includes both Gram-positive and Gram-negative bacteria, including *M. aureus, Str. hemolyticus, D. pneumoniae,* and *Pr. vulgaris.* It is especially active against *M. aureus.*

Indications in Dogs and Cats. Streptococcic, staphylococcic and Proteus infections, particularly those resistant to other antibiotics and in animals allergic to other antibiotics.

In vitro studies have recently indicated that novobiocin and penicillin are synergistic. Combined therapy broadens the range of antibacterial activity against some relatively penicillin-resistant organisms.

Administration and Dosage. Average oral dose of novobiocin for dogs and cats: 15 mg. per lb. of body weight. This is an average daily dose and should be given in equally-spaced doses, if possible.

Prednisolone

Prednisolone exerts glucocorticoid (antiketotic), supportive (antistress), and antiinflammatory effects. Oral forms have been available in the past; intramuscular, intrasynovial, and intravenous forms are recent developments.

Indications: Bovine ketosis, stress-caused or stress-associated conditions imposed by such stressors as pregnancy and lactation, over-exertion and fatigue, trauma, old age, anesthesia, infections, and toxins; and inflammatory conditions of the eyes, ears, skin, synovial membranes, and muscles.

Suspensions may be administered intramuscularly or intrasynovially for prolonged effect; solutions (delta-1-hydrocortisone [prednisolone] sodium succinate) may be administered intramuscularly or intravenously.

Administration and Dosage. Prednisolone is effective at approximately one-third the dose of hydrocortisone. Intramuscular dose of the suspensions for large animals is 100 to 200 mg. Intramuscular suppressive dose for dogs is 10 to 50 mg., for cats it is 10 mg. Intramuscular maintenance dose for dogs and cats is 2.5 to 10 mg. Intrasynovial dose of the suspensions for large animals is 40 to 100 mg., for dogs and cats it is 5 to 25 mg.

Intramuscular dose of the solutions for large animals is 50 to 100 mg., for dogs and cats it is 10 to 50 mg. Intravenous dose of the solutions for large animals is 50 to 100 mg. For dogs and cats it is 10 to 50 mg. Intravenous dose of the solutions for large animals is 50 to 100 mg.; for dogs and cats in circulatory collapse it is 1 to 5 mg., followed by one-half the initial dose at 1, 3, 6, and 10 hours later, or longer if necessary.

Other Therapeutic Agents

Perpetual research efforts are rapidly developing new antibiotics and antibiotic combinations, antibiotic-steroid combinations for antimicrobial-antistress effect, short-acting general anesthetics, intravenous fat solutions for parenteral alimentation, oral nonmercurial diuretics that act by blocking enzyme systems, adrenocortical derivatives, protein-sparing anabolic hormones, antibiotics that are anthelmintic, piperazine parasiticides, and oral antidiabetic agents.

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The Nation's Pets

Americans own 23,000,000 dogs and 27,000,000 cats, according to accepted estimates. Market potential for items of pet care have been the subject of limited survey. It is generally believed that estimates fail to reflect accurate total sales of items pet owners need or must buy.

An example of a limited market survey is that published by the Du Pont Company concerning aerosol household products including pet supplies packaged as aerosols. The report state, "In 1956, sale of body parasiticides alone for external application to pets was $3,600,000. Veterinary biologicals (not identified) accounted for sales of $4,300,000., and all other dog and pet medicaments amounted to $8,300,000. Combining these figures we have an overall market of $16,200,000. for pet preparations today."

Substantial growth is forecast because of the increased trend to suburban living, numbers of children, increased interest in and desire to own a pet, and the fact that pets live longer because they receive better care.

Economical Protection for Radiographic Work

R. M. STONE, D.V.M.
Detroit, Michigan

To reduce the hazards of *x*-ray exposure, the door pictured in the accompanying photograph was built, and has proved very successful in actual practice.

Method and Materials

An ordinary flush door, a sheet of masonite of equal dimensions, and a board 1½ in. thick, 12 in. wide, and of the same length as the door, was purchased at a lumber yard. A ¼ in. sheet of lead the same size as the door was procured through a lead supply company, and a 3 in. x 5 in. piece of lead impregnated glass was ordered through an *x*-ray company. Lead nails were obtained from a roofing company, and hinges and brackets were obtained from a hardware store.

A window was cut through the door, the masonite, and the lead sheet slightly smaller than the glass. The glass was inserted into the door and secured with molding. The lead sheet was then placed flush against the door covered with masonite, and the three pieces were fastened together by lead nails along the margin. The board was attached to the wall with the angle brackets, and then hinged to the door. A shelf was built behind the door to hold the controls.

Operation

The door can be swung out into position and the operator can view the subject and *x*-ray unit while making the exposure, and when not in use, the door can be swung back to conceal the controls, and allow more space in the room when necessary.

This unit was made to fit a particular room. It would be quite simple to modify the unit in many ways to make it conform to any specific situation.

Leptospirosis of Pet Animals

In the paper entitled, Leptospirosis of Pet Animals, (*Vet. Med.*, 52:537 [Nov.] 1957) Randall and Cooper were attributed with the first isolation of *Leptospira icterohemorrhagiae* from the dog. Further surveillance of the literature shows that the first isolation of *L. icterohemorrhagiae* was made in 1919 by Drs. Kirkwood and Horning of Houston, Tex. with the able assistance of Dr. Asa Chandler of Rice Institute. This work was reported in the literature (*Vet. Med.*, 18:936 [Oct.] 1923).

Psittacosis

The *North Carolina Medical Journal* (Oct. 1957) reports an interesting case of psittacosis in which apparently healthy parakeets proved to be the source of infection. The birds in question exhibited no signs of illness during the previous three to five months period before being acquired by the family becoming infected, nor were persons in contact with these birds during this period infected.

Sam, the "Frosh" moved his arms, smoked a cigar and spoke English.

Open House

KANSAS STATE COLLEGE SCHOOL OF VETERINARY MEDICINE

JIM SMITH
Senior Student

THE KANSAS STATE Student Chapter of the A.V.M.A., in cooperation with the staff of the school of Veterinary Medicine, held the first Veterinary Medicine Open House, Saturday, Oct. 26, 1957, in the various veterinary buildings on the campus.

"This is Veterinary Medicine" provided the theme for the project that was designed to convey to prospective students and the public as well the scope of influence exercised by veterinary education on the contemporary American scene. From 10:00 a.m. until 8:00 p.m., 3,500 visitors scrutinized displays and observed demonstrations that have since been characterized "part of the most impressive public relations ever to benefit the profession."

On exhibit throughout the day were educational displays outlining the course of study, books required, and other factors involved in completion of a degree in veterinary medicine. The tour took in displays of the departments in anatomy, path-o'ogy, physiology, and surgery.

Many favorable comments were expressed by veterinarians and nonprofessional viewers of the student project. Students exhibited professional conduct throughout the day-long affair, and displays were not only numerous, but also imaginative.

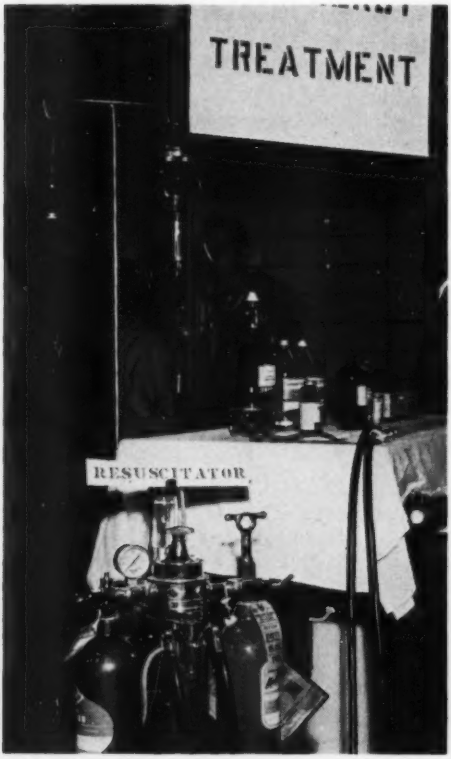
Visiting practitioners, in commenting on the content of the public relations effort, noted that the program had given expression to almost all of the veterinarian's activities within the confined hours of one day, and that "the effort did more for furthering veterinary medicine in Kansas than any other activity in the past few years."

A display by the Physiology Department illustrates the circulatory system. Other displays showed a turtle heart beating in saline, and blood vessels in the web of a frog's leg.

A section of the pathology laboratory was visited by all those who attended the open house program. Some aids and products used in making a diagnosis were on display.

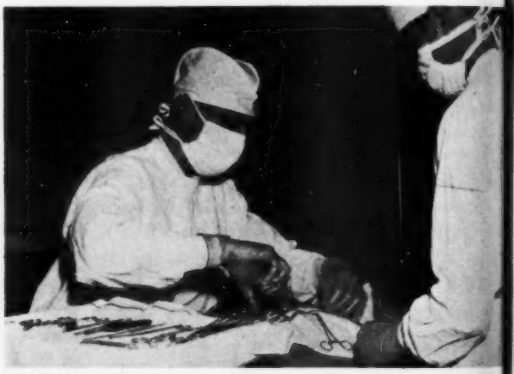
Kansas State Open House . . .

Throughout the day methods used in blood transfusions, fluid therapy, shock therapy, and oxygen resuscitation were demonstrated. A steady stream of visitors viewed this display.



TOP: Dummy surgery was used to demonstrate common technic in veterinary practice. Many visitors were convinced that they were observing actual surgery.

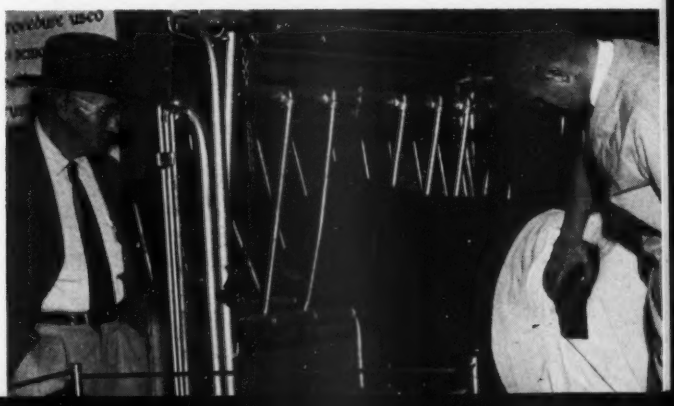
BOTTOM: The dummy cow occupied the large animal operating table for the day long affair.



Many types of horseshoes used in treating animals for lameness were on display throughout the day.

A typical pathology display with laboratory animals used for diagnosis and research.

New drugs, diagnostic aids, and vaccination procedures were on display in one of the examination rooms.



Several cows with rumen fistulas were on display. Students also demonstrated a rumenotomy.

CLINIC

CLIFFORD L. McGINNIS, D.V.M.
Peoria, Illinois

MANY practitioners who operate small animal hospitals will soon be hiring junior students for the summer months. I believe the status of these students can be clarified with some discussion.

With few exceptions, juniors in Veterinary School have not worked or even been in a privately owned veterinary hospital. They, of course, are familar with the operation of the school clinic, but as a junior that experience has been limited. In a recent conversation with a group of small animal practitioners, I discovered that every one has a peak load during the summer months. Dogs are allowed more liberty in the summer which results in demands for more medical care.

Summer Assistant

This is the time one needs additional help and at the same time one can offer a student an opportunity to get experience. Many junior students do not know how to handle or groom a dog. They can hardly be expected to direct others in routine procedures. They usually are not familiar with all the breeds. They are awkward with syringes and drop thermometers. Dogs bite them and they fail to recognize disease processes promptly. These things can be learned only through experience. It is your opportunity to help them. They are not ready to meet clients, and yet they need to be encouraged to observe and follow instructions.

So I contend that a junior student should be hired as an additional kennel man and paid accordingly. He should clean cages and exercise dogs, learn to clip a poodle, and give an enema; how to give a hypodermic injection and run fecal examinations; how to collect blood samples and do a white count; how to bandage a cut foot and treat parasites. Let him learn which animals live and what effective procedures are recognized in the practice. Let him watch a distemper case get worse each day, in spite of all that can be done, and observe a bitch whelp normally.

But do not let him do surgery on your clients' dogs or collect fees for an office call when he can give no service.

If you want a junior student to run your office while you go on a vacation, you should pay him a substantial salary for he is representing himself as your assistant, and of course you know you are legally responsible for any mistakes he makes.

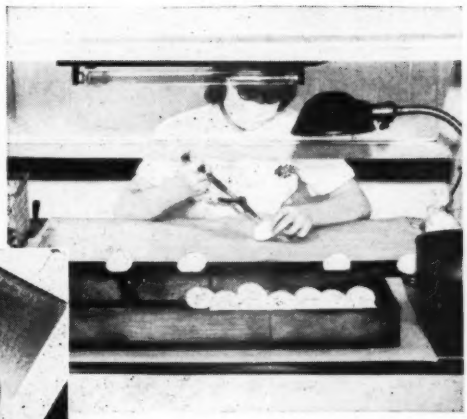
If the student does not want to work as a kennel man but only wishes to observe, then you pay him nothing.

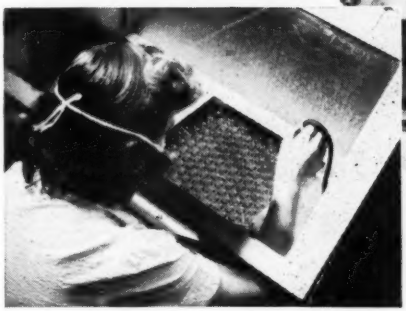
Veterinary Internship

After a veterinary student completes his senior year and has his degree, he is ready to intern. If he wishes to join your staff to gain experience before starting his own practice, he should be willing to stay for six months for subsistence and out of pocket expense. You, as a practitioner, have little to gain.

It takes two or three months to learn the routine of a hospital; in another two or three months the new staff member is gone. Not the least of your problems is client resistance to change. They like to have the same doctor treat their pet. The young graduate knows he can give that rabies vaccine just as good as any other veterinarian, but the client doesn't know it. It is ridiculous to pay this boy a big salary to start unless he is going to stay for a substantial period.

But for the young man the advantages are many. He learns to operate a hospital, how to buy drugs, how to meet people, some of the psychology of client-doctor relationship. He learns what is a fair fee and how to get the work finished by evening. He learns what to expect from a practice and whether he should be a practitioner, teacher, researcher, or meat inspector.





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CASE REPORT

Bovine Oesophagostomasis

WILLARD W. BECKLUND, B.S., M.A.

Animal Disease and Parasite Research Division
Agricultural Research Service, USDA,
Tifton, Georgia

IN ADDITION to reporting clinical parasitism in a Guernsey cow, the author presents some observations on the incidence of *Oesophagostomum radiatum* (nodular worm) infections in cattle in Georgia.*

Andrews and Maldonado[1] reported that calves experimentally infected with single doses of *Oesophagostomum radiatum* larvae developed relatively mild and transient lesions in the intestines, whereas calves given multiple doses of larvae developed much more severe lesions, which remained visible for as long as six months after infection. The administration of multiple doses of larvae to these animals was considered by these authors to simulate the day-to-day acquisition of parasites by cattle while they were grazing contaminated pastures. In the course of a study of the prevalence and distribution of livestock parasites in Georgia, the writer obtained evidence that naturally acquired infections produced lesions in the intestines of cattle similar to those described by the above-mentioned authors following administration of multiple daily doses of nodular worm larvae. The most extreme case of bovine oesophagostomiasis observed thus far in this study is described below. Some observations on the incidence of *O. radiatum* infection and on the occurrence of clinical oesophagostomiasis in cattle originating in Georgia are included.

Case Report

The subject was a three-year-old Guernsey cow, which had become anemic, extremely emaciated, and weak while suffering from a severe, persistent diarrhea. The animal was killed and necropsy revealed the following: An excessive amount of pericardial fluid, a slight enlargement of the mesenteric lymph nodes in the region of the small intestine, thousands of nodules in the intestinal wall, and two areas of superficial ecchymosis in the rectal mucosa, which were free of coccidia and presumed to be due to tenesmus. The intestine contained a fetid liquid, whereas the contents of stomach were normal.

The entire gastrointestinal tract of the affected cow was examined for worm parasites by a method similar to that described by Porter.[2] The abomasum, small intestine, and large intestine were opened and washed in separate containers, and the mucosa of the abomasum and anterior one-third of the small intestine were scraped to insure the removal of worms. The total volume of the contents and washings from each of these organs was determined, and the worms were counted in aliquots. The total number of

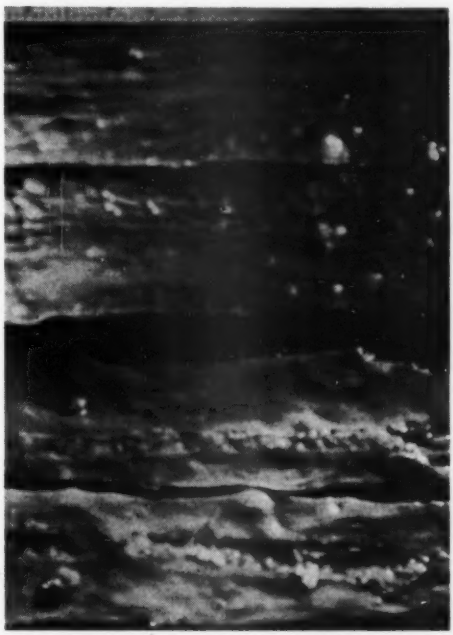

Fig. 1. Sections of the small intestine of a three-year-old cow showing nodular lesions produced by *Oesophagostomum radiatum* larvae, with views of the mucosal surface (top) and the serous surface (bottom) of the same sections of intestines.

*This work was done in cooperation with the Georgia Coastal Plain Experiment Station, Tifton, Ga.

each species of nematode parasites which could be identified was estimated from the number present in each sample. Approximately 5,175 nematodes were recovered and identified to genera as follows: 15 Gongylonema, 2,880 Haemonchus, 320 Ostertagia, 1,560 Trichostrongylus, and 400 Oesophagostomum (fourth-stage larvae and young adults). In addition, 720 larval nematodes were recovered which could not be identified because of the absence of diagnostic structures.

Nodular Lesions

In spite of the small number of nodular worms recovered from the intestinal lumen, the wall of the distal one-half of the small intestine contained approximately ten nodular lesions per square inch, varying in size from less than 1 mm. to 5 mm. in diameter (fig. 1, top). The larger nodules were concentrated in the distal one-fourth of the jejunum and in the ileum. Approximately four lesions in each foot of intestine penetrated the muscularis of the intestine and elevated but did not break through the peritoneum (fig. 1, bottom). There was no inflammatory reaction on the peritoneal surface of the intestine opposite the nodules. The wall of the small intestine, however, was much inflamed and thickened, and the larger nodules were white and filled with pus. Larvae which appeared to be viable were recovered from 50% of the larger lesions examined, including some which penetrated the muscularis. The wall of the cecum contained six nodules per square inch that were from 1 to 2 mm. in diameter and generally dark in color. The cecal wall was moderately thickened.

Since autopsy revealed no abnormalities other than the nodular worm lesions, diarrhea and emaciation were attributed to oesophagostomiasis.

Incidence of Infection

In 1942, Porter recovered *O. radiatum* from 59% of 78 cattle examined from the southeastern states, including 11 head from Georgia. Andrews, Sippel, and Jones[2] reported finding this parasite in all of 14 cattle which were submitted to the diagnostic clinic at Tifton, Ga., for postmortem examination.

The writer recovered this species from 65% of 17 sets of viscera obtained from thrifty native yearlings slaughtered at local abattoirs. These cattle harbored from 17 to 111 mature nodular worms and had few nodules in the intestines. However, 90% of 21 sick cattle which were brought to the diagnostic clinic of the experiment station for postmortem examination were infected with nodular worms. These animals harbored from 31 to 1,920 nodular worms, which were mainly fourth-stage larvae and immature adults, and had numerous nodular lesions in the intestines. Three of the 13 heavily infected cattle had at least eight nodular lesions per square inch of mucosa in the distal one-fourth of the small intestine or cecum. All animals in this group were heavily parasitized by several species of nematodes and displayed one or more of the following symptoms: Anemia, edema, diarrhea, and emaciation.

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Breeding—Rest Fertility

Reference is made to the article, A Breeding-Rest Fertility Program, by Dr. William G. Huber, *Vet. Med.*, vol. 52, p. 586, in which graph 1 is incorrectly constructed. Black bars should indicate "37 control cows," and white bars should indicate "37 treated cows." In the experiment by Doctor Huber, conception rate was shown to increase with uterine infusions during the breeding-rest period at 20 to 45 days postpartum.

Editorial

PURPOSES of PERIODIC VETERINARY LITERATURE

Periodic veterinary literature has traditionally formed the backbone of veterinary science. Its history can not be said to be a long one. But in its short life it has lost not only much of the naivete but its complacency as well. It has concerned itself first, last and always with missing parts in the equation of veterinary knowledge. Were it not for the facilities provided by these media, implementation of modern practice would be unfortunately delayed, since the primary purpose of professional journals is to provide information immediately to a wide reader audience. Periodic literature then serves as a means of communication, a message center, ready to advise all members of new developments in the laboratory or field.

The rank and file practitioner as well as the research scientist have never remained content to wait for the eventual triumph of improved knowledge. This, indeed, would be somewhat like letting others do the fighting. If, from time to time, sound professional advancement is invaded by a debased or immature sort of pragmatism, its prompt rebuttal in the responsible periodic press provides a ready index of the profession's intellectual progress.

The second purpose of periodic literature fits the scheme of the whole. While serving as a disseminator of information, it provides the means for the research authority, specialist, and the average practitoner to report his findings, express an opinion, propose an idea, or record an interesting clinical experience. The idea that veterinarians must read to advance or maintain an acceptable professional standing is axiomatic. So rapid is veterinary progress that failure to "keep up" is tantamount to neglect of the responsibilities one owes his clients.

Books are valuable records of scientifc progress to be sure. But books are almost obsolete as soon as they are available. Writing a book is a monumental task usually left to teachers and specialists in designated fields, and is ordinarily impractical for the average practitioner. On the other hand, a scientifc paper in a periodic journal is within reach of the average veterinarian. Publication is usually prompt. A brief report of a clinical experience is often of considerable value to readers, as well as the author. These reports appear side by side with strict scientific articles. Each adds a contribution of major or minor proportions. In the aggregate they spell out the story of progress in veterinary science and art.

Not all material published in periodic journals is new. Actually few major new discoveries are made in a century. Advancements of technics is not dependent exclusively on new developments. It depends largely on filtering what has been learned or is known through experiences of investigators or clinicians. A report of a simple, more efficient methods to do a thing has potential advantage to both clinician and patients. The progress of science is always in the direction of the simplification of what seemed complex before.

Perhaps the rewards of reading are greater today than for any other period in American veterinary history. Not only is the pace of progress accelerated beyond any previous experience, but trends in production and management of food producing animals suggest the need for adjustments in the operation of a practice. These will vary between wide extremes considering location, species of livestock, and local practices. Problems also differ and vary and become more complex in proportion to the needs of the grower or the market he serves. Grist for editorial mills must be tangible and arise from qualified sources.

If the practicing veterinarian in the field finds controversies to be a sort of Hydra—with no single head upon which to deliver a lethal blow — then it is up to the editorial staff to recall the lessons of history while presenting material in a manner best calculated to bridge any gap that may exist between the author and the reader.

There is no substitue for the satisfaction of learning by reading. Periodic journals such as VETERINARY MEDICINE gain and hold the respect of readers in exact proportion to the manner in which they meet the requisites of serving readers, and in serving professional purposes for postgraduate study.

Toxicologists Form Organization

Formation of the American Board of Veterinary Toxicologists, an association for veterinarians interested in the field of toxicology, was announced recently as a result of a meeting held by the Committee of Toxicologists in connection with the annual meeting of the Washington State Veterinary Medical Association. Dr. H. E. Furguson, Anaconda, Mont., was named president; Dr. G. R. Spencer, State College of Washington, Pullman, vice president.

Constitution and bylaws will be up for consideration at the meeting held January 16-18 in Salt Lake City.

All veterinarians who are interested in veterinary toxicology and who can pass membership requirements are urged to correspond with Dr. G. R. Spencer, College of Veterinary Medicine, Pullman, Wash.

The group is developing a 35 mm. film series on fluorosis to be used in teaching which will be made available through the A.V.M.A. film library. Another project under development is a clinicians' guide to fluorosis in livestock.

·VM·

In 1956, an average of one egg per day was consumed by every man, woman and child in the United States.

Laboratory Animal Medicine

Established to encourage education, training, and research, the American Board of Laboratory Animal Medicine was launched by Charter Fellows. Required qualifications of this group include besides a veterinary degree, a master of science degree or equivalent plus five or more years experience in the specialty.

Fellowships in the group are now open to veterinarians who have met requirements, who complete satisfactorily the Board examination, and who are elected by a majority vote of council members.

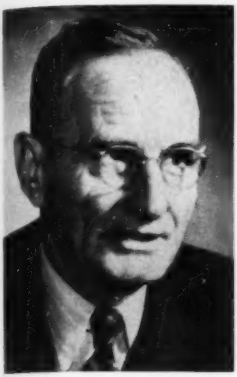
Associate membership is also open to those veterinarians who have had at least three years of postgraduate experience in laboratory animal medicine and who can meet all the prerequisites for the Board examination except the advanced training and experience requirements.

Application for membership either as a Fellow or Associate may be secured from the secretary-treasurer, Dr. Robert J. Flynn, Argonne National Laboratory, P.O. Box 299, Lemont, Ill.

·VM·

Farm income from poultry amounts to $3,000,000,000. to 4,000,000,000. per year. This is approximately 11% of the total cash receipts for all farm products.

Dean R. S. Sugg...



R. S. Sugg, D.V.M.

At press time word has been received that Dean R. S. Sugg, Alabama Polytechnic Institute, School of Veterinary Medicine, Auburn, died recently, apparently as a result of a stroke. Detailed comment on the contributions of Doctor Sugg to the veterinary profession will be made in a future issue.

The Spring Dilemma

Continued from page 86

Automobile Expenses

Automobile expense should be accounted for. The entire cost of operating the car, while used in the production of income, is an allowable deduction. This cost should be detailed in schedule C-2 of schedule C, or on a separate sheet, and the total entered on line 21 of schedule C, included with any other allowable expenses not listed on other lines of the schedule. Those who have a second car for personal or family use are in a better position to establish all of their deductible car expense. When there is only one car, only that portion of the operating expense applicable to the practice can be deducted. The cost of transportation from home to office is not an allowable deduction.

Deductions

On completion of schedule C, the net profit or loss shown on line 23 of the schedule should be entered on line eight, page one, of the tax return form 1040. Other income must be entered on page one or page two of the return with the total of page two carried forward to line ten of page one. The total must be entered on line 11 of page one. If personal deductions exceed 10% of income, or $1,000., the maximum statutory deduction, it will be necessary to list them on page two of the tax return.

In listing contributions, it is well to remember that they can not exceed 20% of the gross income shown on line 11, page one of the return form 1040, except that an additional 10% for contributions made directly to religious organizations, regular schools, and hospitals may be deducted. Some contributions to professional organizations may qualify as a necessary expense for entry on schedule C.

All interest and taxes not included in schedule C must be entered as a deduction.

Medical Expenses

Medical expenses in excess of 3% of gross income, and drugs in excess of 1% of the gross income are deductible. Medical expenses can not exceed $2,500. for each exemption exclusive of exemptions for old age and blindness. Those over 65 years of age may deduct all medical expenses, but must limit the deduction for drugs and medicine to the amount in excess of 1% of gross income.

Other deductions include the cost of safe deposit box rental and investment counseling service if income from securities is involved. Also, any fee paid to an accountant or tax counselor for preparing the return is deductible.

The dividend exclusion of $50. is available to the recipient of the dividend. On a joint return only $50. can be deducted if all of the stock is in one name. If the stock is held jointly or if a spouse also has dividends from stock, $100. on a joint return can be deducted.

Income from other sources over $900. for those under 65 years of age and over $1,200. for those over 65 and under 72 years of age generally eliminates the retirement income credit for those gainfully occupied. This credit is available to those over 72 years of age who have income that will qualify.

Animal Health

R. R. DYKSTRA, D.V.M.

Scrapie in Sheep Reportable

Scrapie of sheep is still, in a measure, a mystery ailment. It appears to have a long incubation period, possibly from one to three years duration, which complicates epizootiological work. The consensus by researchers concerning etiology chiefly favors a filtrable virus. However, if it has a virus etiology its resistance to destructive agents is great as it withstands long periods of boiling, as well as the action of such strong viricidal agents as 3% formalin, 2% phenol, et cetera. The outstanding clinical evidence of the disease is pruritus, followed later by inanition. It is a disease primarily of mature animals. Diagnosis following an autopsy is based largely on the finding of vacuoles in the cells of the central nervous system. The clinical differential diagnosis involves scabies, listeriosis, louping ill, maditch (Aujesky's disease), and general skin parasitism. If the ailment is diagnosed or suspected, state livestock sanitary officials should be notified at once.

Carcinogenesis

In a recent issue of *The Journal of the American Medical Association,* (Dec. 7, 1957) there appears an excellent article in which is presented that the removal of the adrenal glands in human females will result in "profound regression" of advanced mammary cancer. Success of surgery is provisioned on the premise that "the tumor must be dependent on adrenal hormones and, specifically, that the adrenal glands must elaborate sufficient amounts of those steroids which maintain the growth of the neoplasm." The patients were, after the adrenalectomy, maintained adequately by means of steroid substitution therapy. There are, of course, many different causes of malignancies, some in some animals, and some in others. Hormonal unbalance resulting either from single glands or a combination of glands such as the thyroid, pituatary, ovaries, and testicles has been incriminated; bacteria such as the agrobacteria organisms in plants and the tubercle bacilli produce growths that finally become malignant. Carcinogenic hydrocarbons, nuclear radiations, *x*-rays, and viruses, in animals at least, are all potential malignancy producing agents. Cells have been endowed during millions of years of development with finely balanced organization having only diminished capacity for spontaneous change, but it appears that a small increase in entrophy will place the cell in another viable state. When malignancies thus result there is no return to a normal state except, as in the article quoted early in this presentation, certain specific steroids maintaining the growth are removed or in those rare cases, as yet not understood, of spontaneous regression.

·VM·

Extreme nervousness and savageness characterized four sows at farrowing. They refused to accept first born pigs and developed such state that the farrowing process stopped. When administered in the early stages of farrowing, 200 mg. of chlorpromazine intramuscularly produced dramatic results in these patients. Tranquilizing effect was evident in approximately 15 minutes, after which sows became tractable, farrowing was resumed, and milk flow started.

·VM·

Rutgers University researchers report that the tranquilizing chemical known as meprobamate did not calm excitable leghorn fowl. Even with doses larger than ordinarily administered to human beings there was no observable effect in so far as growth, feed efficiency, and tranquility were concerned.

Morris Erdheim, D.V.M.

Nutrition

Sugar for Hogs

Satisfying the sweet tooth of hogs has practical advantages, according to work conducted at the Arkansas Agricultural Experiment Station and Louisiana State University.

Feeding sugar 48 hours before shipping hogs to market resulted in less shrink in curing and smoking the hams. There was some suggestion that flavor, texture and tenderness were also favorably affected by this practice.

The Arkansas work was based on supplying the sugar in the drinking water. The levels provided were 2 to 3 lb. of sugar in 5 gal. of drinking water. Hogs consumed about 1 lb. of sugar per head.

The Louisiana study suggests that baby pigs fed rations containing sugar will gain weight faster and be marketed earlier than pigs not fed sugar.

Drouth, Floods, and Nutrition

It may be that there is little we can do to change the weather patterns. Nevertheless, they are important to the livestock producer trying to prvoide adequate feed for his stock.

Areas of severe drouth changed into flood disaster areas in a matter of days during the past spring. Last summer, a new drouth area was charted on the weather map; the northeastern part of the United States.

Cattle production doesn't stop completely whenever the weatherman's unfavorable predictions come true. How and what to feed under the circumstances are practical questions which the nutritionist must answer for the feeder. Making most efficient use of what is available is one of the considerations. This includes developing supplements to feds like prickly pear, mesquite, and poor quality roughage. Properly supplemented these feeds can supply enough energy and essential nutrients to at least maintain the herds until nature is more generous.

We may never learn to control the weather to suit our wants, but we are learning how to "make out."

Corn Silage Proved Valuable for Bred Sows and Gilts

It has been accepted generally that sows kept in a lean condition farrow the best litters. Corn silage has proved to be an excellent feed to keep sows lean. Of course, it must be properly supplemented to provide energy, protein, vitamins, and minerals.

For hog feeding, corn silage must be high quality, cut short, and ensiled while the plant is green. It should be chopped finer than for cattle feeding.

The recommended practice is to start feeding silage at least three to four weeks before breeding. If this is inconvenient, the change to the corn silage program should be made immediately after breeding.

Sows will eat about 10 to 12 lb. of corn silage a day. The balancer to be fed along with the silage is a 20% protein supplement. According to Catron and coworkers at Iowa State College, this supplement should be fed at the rate of 2½ to 3¼ lb. per head per day for the first two-thirds of the gestation period and 4 to 5 lb. the last one third of the gestation period.

The practical advantage of corn silage for sows are (a) reduced cost of pig production, (b) improved reproductive performance, and (c) farrowing an extra pig per litter.

Poultry Practice

W. R. HINSHAW, D.V.M., Ph.D.

Over 200 papers were presented at the 46th annual meeting of the Poultry Science Association, Aug. 6-9, 1957, Columbia, Mo. Selected reports of special interest to veterinarians will be reviewed on this page in this and future issues.

Effect of Hormonization

Of several papers presented on estrogenetic substances, two dealt with their effects on quality as determined by tenderness, juiciness, and flavor. Wesley and Stadelman, Purdue University, found that when 15 mg. diethystilbestrol was injected as a paste in eight- to 11-week-old chickens, treated males became more tender than treated females. Hormonizing did not affect amounts of juice extracted, but it was of interest that females whether treated or not were more juicy than the males. In another paper from Purdue University, Fry and associates reported that hormonization had no effect on baked meat, but did affect flavor of broth in ten- and 14-week-old birds, although not in six- to eight-week-old ones.

Talmadge, University of Connecticut, reported on experiments to determine the effect of injecting eight-week-old New Hampshire pullets each with a pellet containing 12 mg. of diethylstilbestrol. Treatment apparently lengthened the average age to 50% production and reduced the average size of eggs laid. It did not affect hatchability.

Adams, University of Wisconsin, compared the effect of diethylstilbestrol and dienestrol diacetate as growth and fattening aids for turkeys. He found that diethystilbestrol administered as a paste or pellet produced superior effects to the same drug given as a liquid or in oil. Dienestrol diacetate fed in a mash at 31.75 mg. per lb. produced no favorable effect on gain, only slight improvement in finish and depressed feed efficiency. Mounteney *et al.*, Texas A. and M. College, reported that 0.15% thiouracil depressed rate of growth and meat yields of edible portions. Diethylstilbestrol gave best over-all results in their trials.

Vitamin E Deficiency

Of several papers on vitamin E, one by Stokstad, Patterson, and Milstrey, American Cyanamid Company, deserves special comment. These investigators observed that chicks fed a diet containing torula yeast as a sole source of protein developed exudative diathesis when vitamin E was omitted from the diet. By adding 40 units of tocopherol acetate per kilogram of diet these symptoms were prevented. They also reported that exudative diathesis could be prevented by vitamin-free casein or defatted pork kidney.

From these latter observations, they concluded that these animal tissues contain a factor which is different than vitamin E but having similar physiological effect. Studies made in attempts to concentrate the animal tissue factor suggested that some volatile inorganic acid such as a compound of arsenic, selenium, or tellurium might be involved. Subsequent findings proved that selenium as selenite at a level of 0.3 p.p.m. gave complete protection against exudative diathesis. Both arsenic and tellurium were inactive.

Environmental Stress Factors

Burger, VanMatre and Lorenz, University of California, studied the effect of drugs in stress due to heat. The physiological responses measured included survival, body temperature electrocardiographic, electroencephalographic and pneumographic patterns. Drugs that showed promise in heat stress included chlorpromazine, reserpine, barbiturates, morphine, and adrenolytic drugs. Atropine had no effect.

Responses to high environmental temperatures as modified tranquilizing drugs measured in terms of survival, egg produc-

tion and egg shell quality, were also studied by these investigators, using chlorpromazine and reserpine. Both drugs afforded protection against decrease in egg production and shell quality following heat stress. Both were also effective in prolonging survival at high temperatures but the effect was modified by route of administration, duration of treatment, dosage and age of the birds. In chicks less than four weeks of age chlorpromazine was either ineffective or depressant. In chicks four weeks of age or older, 100-500 mg./kg. of feed was effective; in chicks seven weeks of age or older 25-50 mg./kg. of feed was effective. Both drugs were deleterious when injected.

The effects of season and environmental temperatures on reproductive ability of male turkeys were reported by Law and Kosin, Washington State College. In their studies one of two groups of mature Broad Breasted Bronze males was exposed to "uncontrolled" outdoor temperature of 55 F. with minimal day length of 13 hours. Results were based on semen production, thyroid activity, and sizes of testes of representative males killed at intervals during the two years of observation. Histological examinations of reproductive tissues also served as a criterion. The indoor environment was more conducive to semen production during the first autumn and the second winter season. No semen was produced by the outdoor group during the second winter season, but in these two-year-old outdoor males spermatozal counts returned to normal in the spring (April) and then exceeded the indoor male counts.

Diseases of Poultry

Four sessions of one-half day each were devoted specifically to avian diseases. Papers presented included the following:

Infectious Synovitis (IS)

All five papers on this disease have to do with treatment. Thayer *et al.*, University of New Hampshire, however, reported mainly on the epizootiology of the disease and attempts to study the properties of the causative agent in flocks having a total of 25,000 birds. The disease occurred as early as six days of age. Isolations were made and the agent studied in both chicken embryos and in tissue cell culture. Chorioallantoic membranes of nine- to ten-day-old embryos and tissue cultures of renal cells or heart fibroblasts successfully grew the agent. Olson and Shelton, West Virginia University, reported that the rate of development and spreading of IS is influenced by the pathogenicity of a given culture.

The fact that the disease does respond to antibiotic treatment would indicate that the causative agent is either a virus of large particle size or a rickettsial-like agent. Olson and Shelton have reported success with chlortetracycline, oxytetracycline, tetracycline and furazolidone (NF-180) added to the feed. These results are similar to those reported by Seeger, *et al.*, American Cyanamid Co., and Cover, University of Delaware.

Infectious Laryngotracheitis (IL)

Infectious laryngotracheitis, a disease which has received little attention in recent years, was the subject of three different papers. Kingsbury and Jungherr, University of Connecticut, reported on 17 cases of IL which came from one community within a period of three months. Mortality alone in these outbreaks cost the poultrymen at least $18,000. The disease was apparently introduced by a crew of workers to one farm and it spread to other farms by man, dogs, rats, and crows. The University of Connecticut investigators in another paper by Satriano *et al.* reported the isolation of IL virus from the lacrimal fluid of 19-day-old Cornish-Cross chicks which did not exhibit respiratory signs. The virus strain isolated proved in subsequent study to be a mild one but having definite immunizing properties. The third paper in the group on IL presented by Hitchner and White, American Scientific Laboratories, was concerned with the correlation of embryo and bird infectivity of five strains of IL virus.

•VM•

Poultry requires eight calories of grain to produce one calorie of meat or eggs.

Practitioner's Laboratory

W. L. SIPPEL, B.S., M.S., V.M.D., Ph.D.

Antibiotic Sensitivity Testing

This technic has been placed within easy reach of any practitioner by the commercial availability of prepared blood agar plates and antibiotics sensitivity test discs. (Fig. 1 and 2.)

Antibiotic sensitivity testing will be found useful in connection with the testing of milk samples for mastitis as described. (See VETERINARY MEDICINE, 52:611 [Nov.], 1957.) Among other conditions in which this test will be invaluable are persistent diarrhea, otitis, clinical mastitis, and indolent ulcers.

In the simplest form of the test, the purchased blood agar plate is streaked with the swab (also furnished)[1] that has been dipped in the material to be tested. The antibiotic sensitivity ring or discs containing selected antibiotics are placed on the streaked surface of the plate. The plate is then placed in an incubator at 37 C. (98.6 F.) and read at 12 and 24 hours, (fig. 1). If sufficient growth does not occur in 24 hours, longer incubation is provided. Small incubators can be purchased for approximately $17.[3] or a good larger one can be made for about $25. from an old refrigerator, using a chick brooder wafer thermostat[4] and a light bulb for heat.

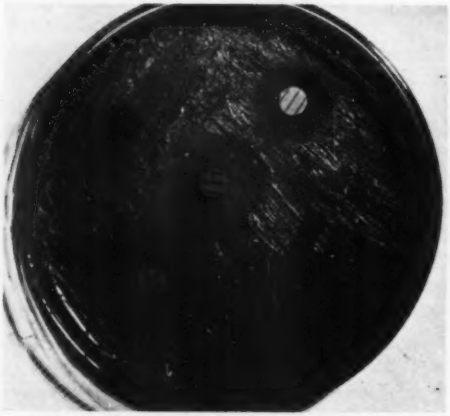


Fig. 1. Antibiotic-sensitivity test, using overnight incubation of a pure culture streaked on agar surface, read at 24 hours.

Rapid Test

A test originally described by Jackson *et al.*,[5] requiring only three to four hours for most organisms, can also be performed. In addition to the blood agar plates, brain heart infusion agar[6] containing 0.8% added dextrose and tubed in 5 ml. amounts is necessary. This media is prepared by adding water to the dry powder, boiling to melt the agar, tubing in 5 ml. amounts, plugging the tubes with non-absorbent cotton and sterilizing in an autoclave or household pressure cooker at 15 lb. for 20 minutes. The media is then stored until needed, at which time it is heated in boiling water to melt the agar. When it has cooled to about 50 C. (120 F.), 1 ml. of the material to be tested (mastitis milk, feces, or the swab) is added to the melted media, which is then poured evenly on to the surface of the blood agar. When it has hardened, the antibiotic discs are placed on the surface.

In the rapid test, the growth of the bacteria will produce relatively intense reducing conditions which will darken the blood agar. If an antibiotic disc inhibits the growth of the bacteria, the blood agar will remain its original bright red color, indicating an antibiotic probably effective against

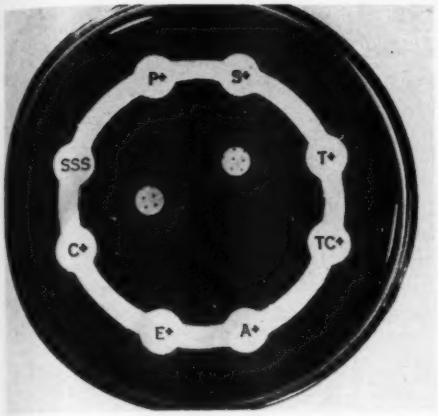


Fig. 2. Rapid antibiotic-sensitivity test at four hours, using ring and disc types of tests.

the organism(s) in question. (Fig. 2.) The test can be read in three or four hours. Slow growing organisms will require longer incubation.

More easily read tests will be had if blood agar plates containing 20% citrated, sheep, cow, or dog blood are prepared for use. This is made as outlined above, using blood agar base[4] to which the blood is added after the media is sterilized and cooled to 50 C. (120 F.). In the 12 to 24 hour test in which the material is streaked on the plate, an effective antibiotic is indicated by an area of inhibition of growth around the disc. The preliminary reading made at 12 hours should serve as the basis for the selection of therapy that can be started immediately.

Precautions

Effectiveness of an antibiotic by this test is not an absolute indication of its effectiveness in the live animal. While there will be rare cases of this nature, there will probably be at least an equal number where the synergistic effect of the body defenses will cause an antibiotic to perform better *in vivo* than it did on the plate.

The plates should be incubated for at least 24 to 48 hours before discarding, as some slow growing pathogens could conceivably appear on prolonged incubation in an area of apparent inhibition of growth. Of course, treatment with the indicated antibiotic should be initiated on the basis of a four-hour (rapid method) or 12-hour (regular method) reading. In the rare cases where necessary, a change in the therapy could be made if indicated by a later reading of the plate.

Occasionally colonies will be seen to grow in an area of apparent inhibition of growth. These will either be resistant variants of the organism being tested, or a resistant organism or contaminant present in low numbers.

The size of the zone of inhibition is not significant of relative effectiveness of antibiotics, due to varying rates of diffusion of different antibiotics through the agar.

1. Haver-Lockhart Laboratories, 1915 Broadway, Kansas City 10, Mo.
2. Hyland Laboratories, Richland, Calif.
3. Norden Laboratories, P. O. Box 1544, Lincoln 1, Neb.
4. Available from mail order house catalogues.
5. Jackson, J. L., Dye, W. E., and Mitchell, R. B., Use of Hemoglobin Indicator for Rapid Method of Determining Antibiotic Sensitivity of Microorganisms. *Tex. Rpts. Biol. & Med.*, 12:171, 1954.
6. Difco Laboratories, 920 Henry St., Detroit 1, Mich.

Foot and Mouth Disease Epizootic in Turkey

Though endemic in Turkey, foot-and-mouth disease became epizootic in that country during the past year.

Turkish authorities vaccinated 20 of their good herds which appeared to confer some protection. Infection developed in only four of these. Death losses were estimated between 4 to 6%, but loss of milk, and crops lost due to lack of draft power will certainly amount to millions of dollars.

Turkey is a constant source of infection. Several European outbreaks have had their origin there. Veterinary authorities there claim invasion from Syria, Iraq, and Iran. Concern is expressed that the Asian strain of foot-and-mouth disease virus, might gain entrance into Turkey and through the Balkans to Europe. No vaccines are being produced that will confer protection against the Asian strain.

Books reviewed in this department and any other books, if available, may be obtained by remitting published price to the Book Department, VETERINARY MEDICINE, Suite 803 Livestock Exchange Building, Kansas City 2, Missouri.

Practitioner's Bookshelf

MUST MEN STARVE, by Jacob Oser, 331 pages, Abelard-Schuman, Ltd., New York. N. Y., publishers, 1957. Price—$4.50.

"Impartiality is either a delusion of the simple-minded, a banner of the opportunist, or the boast of the dishonest. Nobody is entitled to be unbiased towards truth or falsehood."

With this searching statement by Gaetano Salvemnini to set out the spirit of his inquiry, Professor Jacob Oser has given the best analysis to date on the greatest problem confronting the world; the production of enough food to ward off hunger and poverty. The problem is a formidable one, and one of interest to veterinarians concerned with the production of a considerable portion of the world's food supply.

About two-thirds of the world's 2,600,000,000 people are not getting enough to eat, and more than half are starving on less than 2,000 calories per person per day. The problem was popularized by Vogt[1] with the typical neo-Malthusian warning that current population increases are more dangerous than the atom bomb. The argument itself is as old as 1798, when Thomas Robert Malthus first set forth his Law of Population.

What the gloomy Malthus predicted, a world forever floundering between the Scylla of geometrically increasing population and the Charybdis of arithmetically increasing food supply (or diminishing returns on land), only to be doomed on the shallows of disease, poverty, and war, has been refuted in Must Men Starve.

Of particular interest to veterinary readers are Oser's topics on plant and animal breeding and feeding, the cost of insects, the tariff paid to rodents, and potential methods for increasing meat food products. Statistics are presented in a narrative form that not only makes Must Men Starve fascinating reading but at the same time gives data that is staggering to contemplate.

Veterinarians may be surprised to learn that "In China before World War II, 10% of the cattle and water buffaloes, 20% of the hogs [past weaning] and 60% of the chickens died of infectious diseases annually . . . Rinderpest, a completely eradicable disease, kills more than 2,000,000 head of cattle yearly in Asia, Africa, and the Near East."

Trypanosomiasis is the worst of many cattle diseases in Africa. It has been calculated that a preventive inoculation would open up millions of acres of arable land to food production, and the author comments that "far too little is spent on research in combating insects and disease throughout the world."

At present rodents and other pests consume or destroy 65,000,000 tons of the world's grain each year, or an equivalent of all the rye, wheat, millet, barley, sorghum, and rice produced by North and Central America in the year 1951.

These facts, together with the knowledge of shortages in one part of the world, and American problems of over-production, indicate that we have not learned to solve our technical and economic problems, and that there is no danger of world over-population for several centuries.

1. Vogt, William, Road to Survival. William Sloane Associates, New York, 1948.

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58-2

Bull Fight

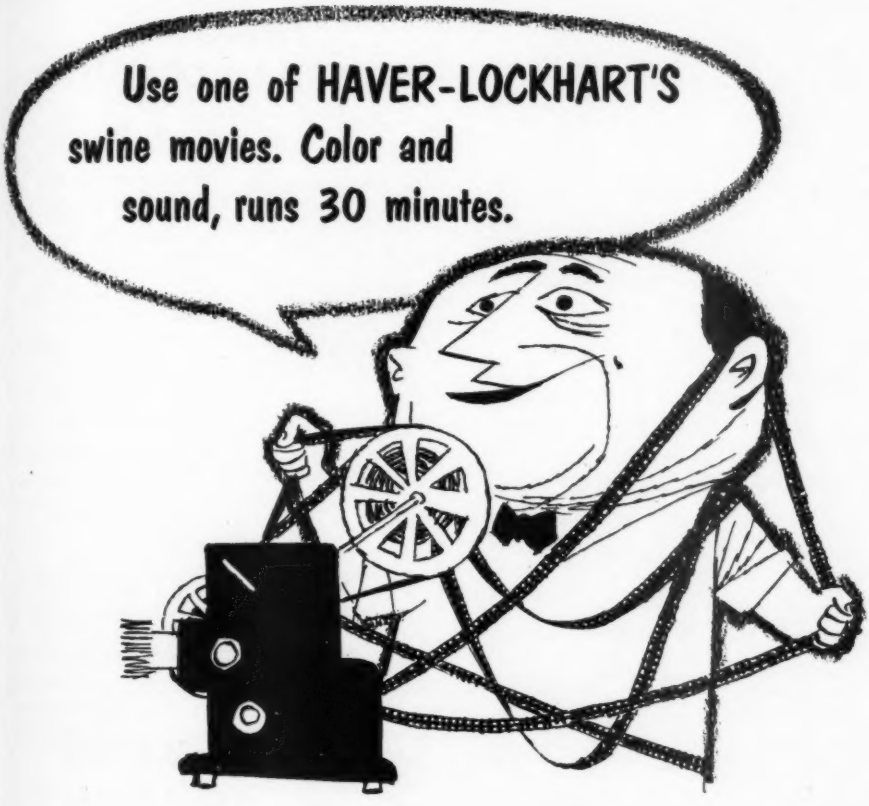
To the casual observer of modern rodeos, the Brahma bull embodies the finest characteristics of all-time toughness. The story has been told that during the Fort Worth Stock Show Rodeo in 1937 a Brahma cleared a nine foot fence and conducted a forced march out the front entrance of the coliseum. Here the animal was met by the stalwarts of the law — armed policemen who proceeded to pump it full of lead. Forty bullet holes later, the bull was down, but not out, and it was necessary to finish dispatching the Brahma by cutting its jugular. Admittedly the Brahma, for all its toughness, was dead.

But experience with tough bulls of the American school is older than the sport that has made the Brahma famous. Dodge City, Kansas correctly claims the historical distinction of conducting one of the two or three genuine bullfights ever held in the United States. The date was July 4 and 5, 1884.

Amidst the flinging of the banderilla and deadly thrusts of the Toledo sword, a very prophetic thing occurred. The greatest cheers of the day came for a Mr. Chappell (described in historical chronicles as "a track horseman and rodeo rider" although the latter distinction seems hardly applicable), the man who was called upon to rope bulls that were too tired, wouldn't fight, or were just plain cowards and wouldn't cooperate in getting themselves killed.

The roping excited the cowhands more than the fancyfooted deftness of the bullfighters. The cry went up: "Throw him, Chappell." And Chappell, willing to try, made perhaps one of Dodge City's first attempts at rodeo type steer busting.

But vindication of the toughness of native bulls came when an animal was "killed" the second day of the Dodge City bullfight. The bull was dragged from the ring and deposited on the open prairie to await disposal by the owner. When the owner came to butcher the animal, it was gone, and a few days later the same animal was discovered in the herd servicing cows as expected of a good bull. Alive and kicking, the old Texas bull was certainly a much tougher bull than the one it took 40 bullets to kill and then stayed dead.—*Charles Walters, Jr.*



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Blackhead (infectious enterohepatitis) of turkeys is a costly scourge of the poultry industry. The disease is usually transmitted by infected feces. An ideal medication is one that will prevent the malady and at the same time permit optimum growth and performance of birds under treatment.

According to an investigation of supression of clinical blackhead in turkeys conducted by L. C. Costello and H. M. DeVolt, Department of Animal Pathology, Live Stock Sanitary Service Laboratory, University of Maryland, College Park, Md., (*Poultry Sci.*, 35:952 [July], 1956), furoxone® appears to have superior advantages over other suggested medicinal agents.

Entirely satisfactory results were achieved with furoxone administered in feed in concentrations of 0.011%, 0.0167% and 0.033% to 124 turkey poults for eight to ten weeks. Results were in general agreement with reports from use of the drug under field conditions. Whereas 31 of 122 untreated controls died, all of 124 treated survived.

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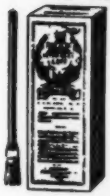

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The Care and Handling of Glass Volumetric Apparatus, a newly revised manual offering valuable information and assistance in prolonging life and accuracy of glass measuring instruments is available to laboratory workers, technicians and students. For free copy of this 24-page reference booklet, ask the Kimble Glass Company, Toledo 1, Ohio.

Kemax Corp.

The Kemax Gun is a new cleaning device that switches instantly from solution application to pressure rinse or dry air, and is useful in cleaning veterinary facilities such as cages. The instrument requires from six to eight cubic feet of air per minute at 100 to 125 PSI. For details write Kemax Corporation, 9717 Luella Avenue, Chicago, Ill.

Horses in Action, a 32 page booklet giving histories of the leading horse breeds, and illustrated with drawings by John Mariani, one of the nation's foremost horse artists, gives details on portfolios of drawings suitable for framing for veterinarians' offices. For the booklet ask Ralston Purina Company, Checkerboard Square, St. Louis 2, Mo.

Sterolit, a functional, highly absorptive a mal bedding material chemically treated make it self-sanitizing and odor killing is e plained in detail in An Entirely New A proach to Laboratory Animal Care. A dress Minerals & Chemicals Corporation America, Menlo Park, New Jersey.

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Films on **Swine Problems** entitled Com Diseases of Baby Pigs and Partners Healthier Swine are available for lectu and demonstrations at group meeti These color and sound films run 30 minut To schedule either title, ask Haver-Lockh Laboratories, 800 Woodswether Road, K sas City, Mo.

Salute to the Veterinary Medical Profession of America, a free pamphlet for veterinarians' waiting rooms and exhibits at state fairs, is available from Schering Corporation, 60 Orange Street, Bloomfield, N. J.

Furoxone® aerodust is being offered by the Eaton Laboratories for flock treatment of chickens affected with chronic respiratory disease (CRD) or air sac infections. A 100 gm. (3 oz.) container is sufficient to treat 1,000 birds. Prices and data are available from Eaton Laboratories, Norwich, N. Y.

Owens-Illinois Glass Co.

Screw-cap Erlenmeyer Flasks are now available in four sizes: 125, 250, 500, and 1,000 ml. Flasks are fitted with a black plastic screw-cap containing a sealed-in rubber composition liner. Solutions and media can be kept both air and vapor tight. For prices address Owens-Illinois Glass Co., Toledo, Ohio.

Straightline Steam Sterilizer, including Laboratory Autoclaves, are available for either cabinet or recessed mounting and either steam or electric heating. The entire line is completely described in a recently published Catalog Master Section 2. For a free copy, check with Wilmot Castle Co., 1908 East Henrietta Road, Rochester, N. Y.

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Veterinary Calendar

Jan. 27-29. **California Veterinary Medical Association,** Midwinter Conference. School of Veterinary Medicine, University of California, Davis, Calif. Dr. Charles S. Travers, California Veterinary Medical Association, 3004 16th St., San Francisco, Calif., executive secretary.

Jan. 28-29. **Louisiana State University,** Department of Veterinary Science Conference. Louisiana State University, Baton Rouge, La. Dr. W. T. Oglesby, department head.

Feb. 9-11. **Missouri Veterinary Medical Association,** Annual Meeting. Hotel Continental, Kansas City, Mo. Dr. W. L. Schondelmeyer, 116 E. Maple, Independence, Mo., convention chairman.

Feb. 10-12. **Wisconsin Veterinary Medical Association,** 42nd Annual Meeting. Pfister Hotel, Milwaukee, Wisc. Dr. B. A. Beach, 1215 Vilas Ave., Madison 5, Wisc., secretary.

Feb. 13-14. **North Dakota Agricultural College,** Annual Short Course. Van Es Laboratory, State College Station, Fargo, Dr. D. F. Eveleth, Veterinary Science Dept., head.

Feb. 16. **American Veterinary Radiology Society,** Hotel LaSalle, Chicago, Dr. J. J. Fishler, 600 S. Michigan St., Chicago 5, Ill., secretary-treasurer.

Feb. 16. **American Animal Hospital Association,** 4th Region Annual Meeting. Veterinary Clinic, Colorado State University, Fort Collins, Colo. Dr. D. T. Albrecht, chairman.

Feb. 17-19. **Colorado State University,** 19th Annual Veterinary Conference. Glover Veterinary Hospital, College of Veterinary Medicine, Colorado State University, Fort Collins, Colo. Dr. Lloyd C. Moss, Department of Medicine.

Feb. 17-19. **Illinois State Veterinary Medical Association,** 76th Annual Convention. LaSalle Hotel, Chicago, Ill. C. B. Hostetler, 1385 Whitcomb Ave., Des Plaines, Ill., executive secretary.

Feb. 21. **Indiana Veterinary Medical Association.** Symposium on Therapeutic Nutrition (Co-sponsored by the Nutrition Committee and Vita Veterinary Laboratories), Marion, Ind., J. M. Carter, 3421 S. Main St., chairman.

Mar. 16-18. **Alabama Veterinary Medical Association.** Hotel Stafford, Tuscaloosa, Alabama. Dr. M. K. Heath, secretary.

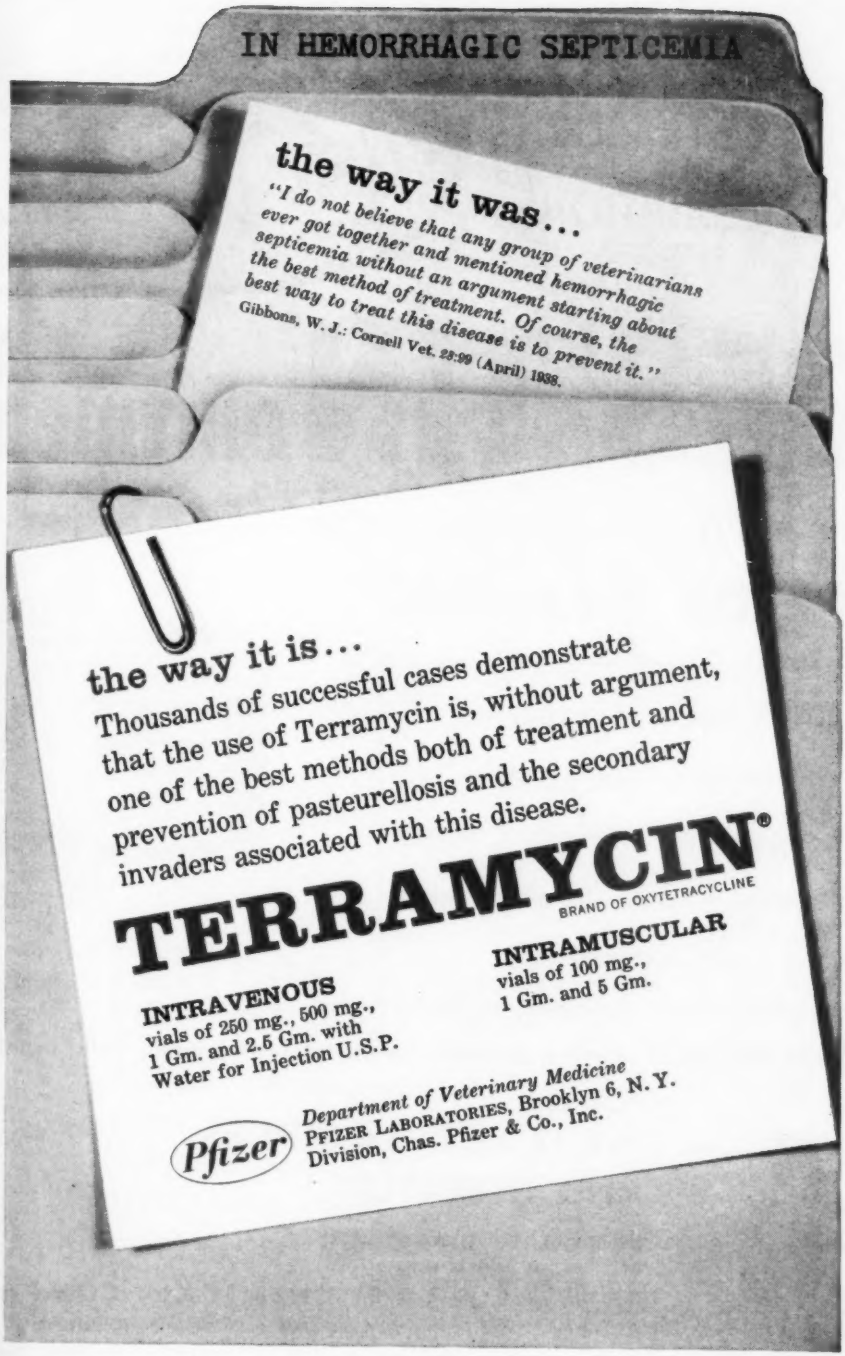
Apr. 23-26. **American Animal Hospital Association,** Annual Meeting. Drake Hotel, Chicago, Ill., Dr. Wayne H. Riser, 5335 Touhy Ave., Skokie, Ill., executive secretary.

May 5- 6. **Oklahoma Conference for Veterinarians.** College of Veterinary Medicine, Oklahoma State University, Stillwater, Okla. Dr. Lester Johnson, Department of Veterinary Medicine and Surgery, chairman.

Jun. 2- 4. **Michigan Veterinary Medical Association,** Annual Meeting. Grand Hotel, Mackinaw Island. Dr. Charles Coy, Hillsdale, Mich., general chairman.

Jun. 5- 6. **Texas A. & M. College,** 11th Annual Texas Conference for Veterinarians. School of Veterinary Medicine, College Station, Tex. Dr. R. D. Turk, conference chairman.

Jun. 24-26. **North Carolina State Veterinary Medical Association,** 57th Annual Meeting. The Washington Duke, Durham, N. C. Dr. C. J. Lange, 3741 Hi-Point Road, Greensboro, N. C., secretary-treasurer.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Gibbons, W. J.: Cornell Vet. 28:99 (April) 1938.
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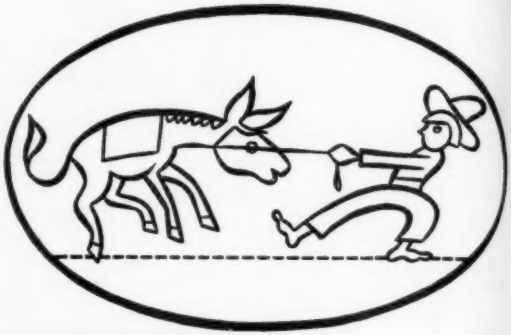

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Founded in 1950 by those in charge of animal quarters in research and teaching institutions, Animal Care Panel is now a formidable organization with a functioning program. Its eighth annual meeting was held last year in San Francisco (Nov. 7-9, 1957).

Veterinarians, who compose the nucleus of the group, have been impressed with the lack of useful, sound knowledge concerning care of experimental animals. The early Panel, consisting of men associated with medical investigators, apparently assumed the validity and applicability of human physiology and pathology based on animal work. Yet basic principles of care of experimental animals resembled witchcraft rather than science. Since that time, considerable knowledge has been gained through frank discussions among those interested, and progress has been made toward assuring a supply of experimental animals in good health. Any compromise of this concept is liable to make experimental results undependable.

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REFERENCES: 1. Mosier, J. E.: Vet. M. 50:605 (Nov.) 1955. 2. Belloff, G. B.: Calif. Vet. 9:27 (Sept.-Oct.) 1956. 3. Pollock, S.: J. Am. Vet. M. Ass. 129:274 (Sept.) 1956.

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Deaths of Veterinarians

EDWARD BAILEY, ONT '05, at Uxbridge, Ont. recently.

OLIVER A. BARBER, IND '08, at Hughes, Ark. October 1957.

HOMER C. BOYD, KSC '21, at Pine Bluff, Ark. October 1957.

ALBERT L. DANIELSON, STJ '21, at Russellville, Ark., October 1957.

WALTER S. DAVIS, CIN '18, 61, veteran of WWI; past master of Gallia Masonic Lodge; at Bladen, Ohio, August 18, 1957.

KENNETH D. DEVINE, WSC '42, 39; veteran CBI theatre of war where he trained dogs for Merrill's Marauders; of a sudden heart attack at Saratoga, Calif., September 28, 1957.

ROBERT ARDEN DICKINSON, API '41, 40, at Union Springs, Ala. October 14, 1957.

FRED E. EMERY, KSC '23, at Urbana, Ill., June 1957.

ARTHUR W. EWING, KCV '12, 75; practitioner for 45 years; at Morrisville, Mo., September 13, 1957.

JOAB P. FOSTER, ONT '00, MCK '08, 66, state veterinarian of South Dakota from 1901 to 1907; inspector with the Bureau of Animal Industry, USDA, 1908 to 1916; Minneapolis division of public health 1919 to 1921; Minnesota public health inspector; chairman, A.V.M.A. Committee on History 1909; member of Minnesota State V. M. A., the American Association for the Advancement of Science, and the American Public Health Association; also holder of B.S. degree from Huron College, So. Dak., 1907; M.S. from Coe College, Iowa, 1914; B.V.Sc. University of Toronto, 1914; M.S. from University of Minnesota, 1920; at Minneapolis, Minn., October 21, 1957.

ABRAHAM J. FARLEY, KCV '04, 90; retired college instructor; former meat inspector, U. S. Bureau of Animal Industry, St. Joseph, San Francisco, and Los Angeles; former instructor St. Joseph Veterinary College and San Francisco Veterinary College; at Queen of Angeles Hospital, Los Angeles, Calif., July 16, 1957.

WALTER L. FEHRENBACHER, ILL '54, 28; practitioner at Williamsfield, Ill.; while making routine calls in an automobile accident near Brimfield, Ill., October 3, 1957.

U. Z. FINLEY, ARK '18, member A.V.M.A., at Sage, Ark. recently.

J. E. HANN, KCV '11, at Neosho, Mo., November 3, 1957.

CLARENCE B. HENDERSON, KCV '09, 72, former practitioner at Osawatomie, and Kirwin, Kans. and at Garden City, Mo.; U. S. Bureau of Animal Industry meat inspector at Chicago, Denver, and Topeka and Leavenworth; member of A.V.M.A., Kansas V. M. A., and National Association of Retired Federal Veterinarians; after a brief illness at Denver, Colo., November 23, 1955.

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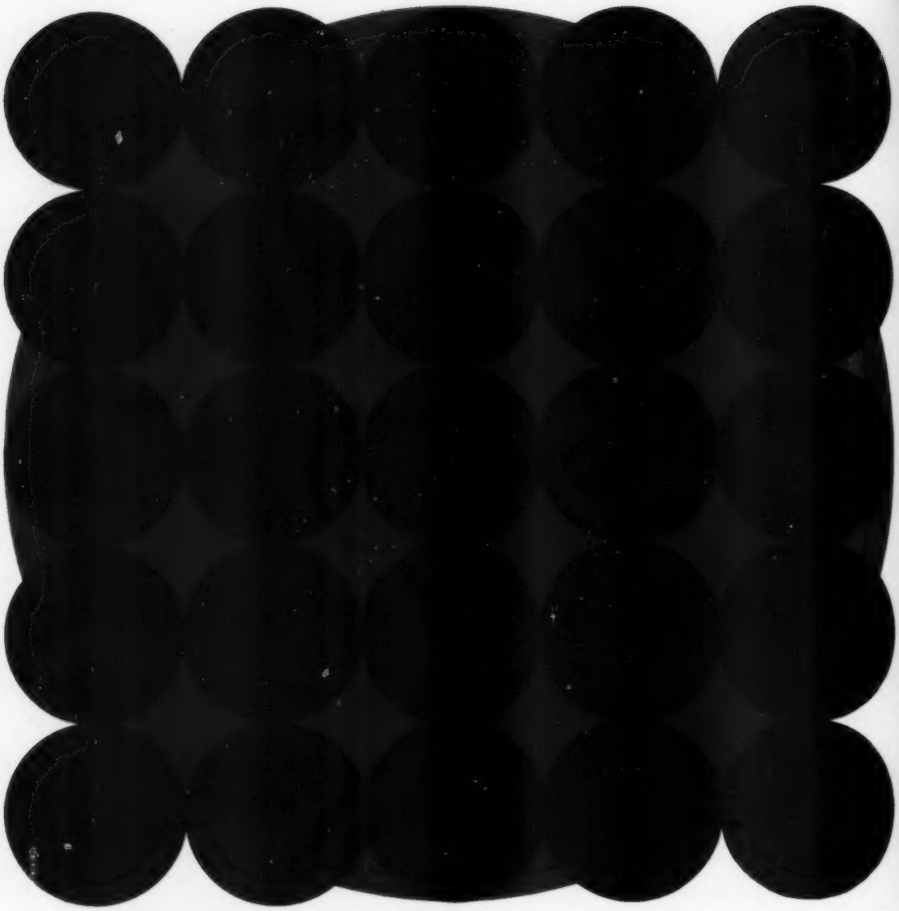

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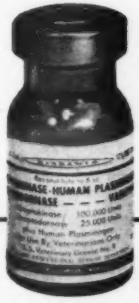

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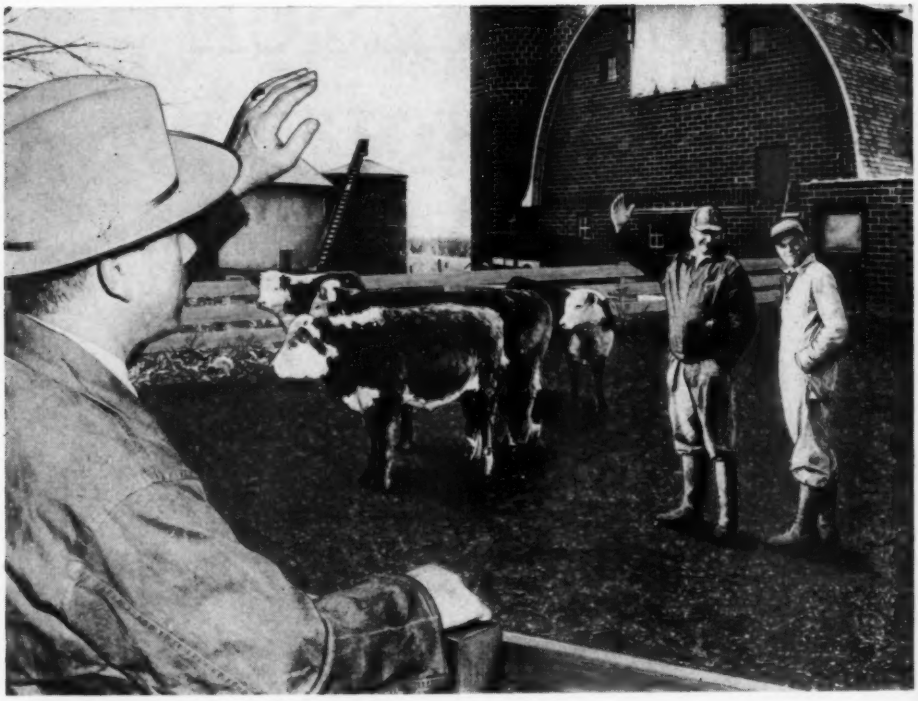

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PROGRAM FOR VETERINARIANS

Your clients will be reading, hearing and seeing even more about the value of veterinary service—and more often—during the next 12 months.

An expanded program of public education has now been launched by Associated Veterinary Laboratories . . . to educate animal owners always to call a veterinarian where animal health matters are concerned. This campaign covers nearly 3,500 newspapers, over 18,000,000 messages in farm magazines, more than 400 radio stations, and 140 television stations. Coast-to-coast, and year 'round, it will tell over and over the advantages of using veterinary service—through Associated Veterinary Laboratories' educational agency, the American Foundation for Animal Health.

This continuing project is made possible entirely through the support of the ethical companies listed on the facing page. If you will bear them in mind, when placing your orders, it will be sincerely appreciated.

MASON'S New KENNEL RUNS
NOW AVAILABLE
For SMALL ANIMAL HOSPITALS
Quickly Erected - NO POSTS REQUIRED
Can be set on concrete or wood floors or directly upon the ground, joining to, or independent of Building. Composed of strong, self-supporting Fence sections and Gate Units with GATES BUILT-IN and Lockable Latches.
FREE CATALOG
Send for Free Catalog with Low Direct Factory Prices of Kennel Fences of all kinds, Kennel Doors, Cages and Hospital Equipment.
THE MASON FENCE CO., Box 77, LEESBURG, OHIO

Public health officials plan to test blood samples from swine for the Asian strain of influenza virus. Swine influenza first recognized in 1918 convinced investigators that it had been contracted from human cases. Swine have been suspected by some authorities as carriers of influenza virus.

Aureomycin® Approved As a Dairy Supplement

Food and Drug Administration officials have approved chlortetracycline (aureomycin®—American Cyanamid Co.) for feeding to lactating dairy cows. Previously prohibited because of lack of proof that antibiotics did not get into milk, research evidence has cleared aureomycin at the levels recommended — 0.1 mg. per lb. body weight per day.

Animal Feed Department, Farm and Home Division of American Cyanamid claims the feeding program has merit as an aid in reducing bacterial diarrhea, prevention of foot rot, and reducing incidence of rhinotracheitis and the shipping fever complex.

▼ ▼ ▼

Iowa researchers report successful trials for the prevention of bloat in pastured herds by the addition of various types of oils to drinking water, grain, fed before animals are put on pasture, or spraying on green forage in the feed bunk.

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Veterinary Medicine

Arrangements have been made by Veterinary Medicine for subscribers to have their journals bound into distinctively designed books..

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in chronic respiratory disease of poultry

FUROXONE® AERODUST VETERINARY

BRAND OF FURAZOLIDONE

provides bactericidal action at the site of infection

A new dosage form for inhalation, FUROXONE AERODUST VETERINARY is a fine, light, yellow powder that contains Furoxone 25%, and remains suspended in the air for 30 minutes or longer. It is indicated for the treatment of chronic respiratory disease (C.R.D. or air sac infection) in poultry flocks.

Administration: For each 1,000 chickens, empty the contents of one 100 gram carton into a dust applicator such as a Hudson Admiral Duster No. 766. In dim light or darkness, direct dust cloud about 2 feet over birds from a distance of 5 to 6 feet from nearest bird.

Supplied: Carton of 100 Gm.

Other Eaton veterinary preparations for poultry:

FUROXONE CONCENTRATE VETERINARY—Feed additive for salmonelloses, histomoniasis, hexamitiasis, synovitis and control of secondary invaders associated with chronic respiratory disease and non-specific enteritis.

FURACIN® WATER MIX VETERINARY—Drinking water additive for the control of outbreaks of cecal and intestinal coccidiosis due to Eimeria tenella and E. necatrix in chickens.
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EATON LABORATORIES, NORWICH, NEW YORK

NEOJEL is now being used in . . .

NEO-VAC

This new Erysipelas Bacterin is the first product produced with NEOJEL that has been thoroughly field and controlled tested to prove its extended immunization qualities.

The use of NEOJEL in concentrating the antigens in NEO-VAC truly affords longer immunity, which is expected to give animals full protection to market.

DIAMOND LABORATORIES

EXTENDED IMMUNITY

a new adjuvant that affords

An important discovery in the field of immunology has been developed through the continuous efforts of Diamond's Research Staff.
This new discovery is **NEOJEL** . . . a new colloidal sol possessing unusual adjuvant and antigen concentrating properties, which offers a more prolonged immunity of killed antigens.

NEOJEL is combined, during production, with the antigen to form a relatively stable physical complex. This fact, coupled with the localization of the injected immunization agent, results in a slow-prolonged release of antigens. This type of antigenic stimulation has proved important in maintaining a high level of durable immunological protection. Controlled tests show a 30% increase over present Erysipelas products in the length of immunity afforded by Diamond's new Erysipelas Bacterin, NEO-VAC. The increase is expected to be greater than 30%, but the newness of the product does not allow the exact length to be determined.

Because of NEOJEL'S bio-colloidal nature and properties, it does not disrupt the physiological state of the injection site, nor does it disturb the balanced homeostatic state present in the animal. NEOJEL's constituents are those that are actually present in the body, thereby eliminating the possibility of untoward reactions.

The unique concentrating properties of NEOJEL allow a small injectable dose to be administered. For example; the antigenic content of a 5cc dose bacterin may now be reduced to a 2cc dose. Moreover, the concentration process does not impair the liquidity of the product, inasmuch as it can easily pass through a 24 gauge needle.

The discovery of NEOJEL by research scientists at Diamond Laboratories is the most important discovery, in regards to killed antigen work, that has been made in the past 20 years.

Diamond Laboratories is pleased to offer this new development EXCLUSIVELY TO THE VETERINARY PROFESSION.

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New multipurpose sulfonamide solution for all species

*Sod. Sulfamerazine 5%
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TRI-SULFA-G combines three sulfonamides in nearly neutral base containing glucose for supportive therapy. Highly stable.

Indications: Cattle: Bacterial pneumonia, shipping fever, endometritis, foot rot, scour-pneumonia complex in calves. **Swine and Poultry:** Respiratory and intestinal infections of bacterial origin. **Dogs:** Secondary infections such as accompany distemper.

Dosage: 50 cc for each 100 lb. body weight, repeated with one-half original dose daily for 2 to 4 days. Also label directions for swine and poultry treatment in drinking water.

Norden® **NORDEN LABORATORIES** LINCOLN, NEBR.

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ANTISEPTIC DETERGENT

In the treatment of nonspecific and bacterial dermatoses and even parasitic diseases, it is important that the cat or dog be bathed with a gentle nonirritating antiseptic detergent. In addition to its safe, gentle and effective detergency, pHisoHex leaves a residual bacteriostatic film on the skin.

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(erythromycin, CSL)

Statomycin (erythromycin, CSL) is the ideal practice antibiotic. Statomycin therapy is indicated for treatment of infections of the respiratory, gastrointestinal, and genitourinary tracts, and for septicemias or local infections. Safe, well-tolerated, and without side effect, Statomycin is supplied in tablet form, 100 and 250 mg., and also in a tablet combined with three sulfas.

STATOMYCIN, I.M.

The intramuscular form of Statomycin rapidly produces a high antibiotic concentration in the tissues. It is particularly useful when initiating treatment, and convenient when administering in hospitals or to large animals. Supplied in 10 cc. vials, in strengths of 50 mg. per cc. (orange label) or 100 mg. per cc. (green label).

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